F 480A.24

use and maintenance

FROM SERIAL NUMBER *3001*

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F 480A.24
use and maintenance

THANK YOU FOR SELECTING ONE OF FASSI CRANES.

This crane is the result of **FASSI** philosophy: ongoing research, rigorous testing, data verification, and analysis of performances.

Many years of experience has allowed us to grant you the maximum safety of operation together with the optimization of machine performances.

All this represents the core of **FASSI quality system**.

FASSI quality system is in conformity with UNI EN ISO 9001 - ISO 9001.

The fitment of the crane on the vehicle must be carried out in accordance with the instructions given by **FASSI** in the manual for hydraulic crane fitting and the relevant chassis manufacturers directives.

The Manufacturer declines all responsibility and guarantee if the fitting is entrusted to workshops without sufficient technical capability to carry out the work in conformity.

Be sure that the unit has been installed, inspected and tested in accordance with the local legal requirements.

As well as the principal safety norms, this manual contains a description of the crane and the instructions for use and maintenance.

The following instructions refer to mobile cranes in general and must be integrated with the manual for use supplied by the centre responsible for the crane fitting on truck, vehicle or other type of structure.

READ THIS MANUAL CAREFULLY prior to use or any maintenance. A few minutes spent now could save time and labour later.

Always conform to the safety norms and the instructions for use and maintenance contained in the present manual in order to guarantee a long life to the crane.

FASSI GRU IDRAULICHE

NOTE

All the paragraphs marked by the CE symbol refer to components required within the europen community.

The above-said components may be optional in other countries in accordance with the national regulations in force.

NOTE
The original version of the present manual is in italian.

B0 SAFETY NORMS

Strictly conform to the norms reported by the plates DE4236 (fig. 1) placed next to the controls, in order to avoid possible accidents while operating the crane.

Only authorized persons are allowed to operate the crane.

The crane must be used on firm, level ground.

Check that the vehicle hand brake is on and that the wheels are chocked.

Before every operation make sure that:
- no-one is within the working area of the crane;
- the safety devices are in place and operative;
- the minimum safe working distances from power lines are observed;
- the load is correctly slung and hooked.

Stabilize the vehicle by the outrigger rams, making sure that:
- the lateral supports are fully extended;
- the wheels are in contact with the ground and the suspension is not completely unloaded.

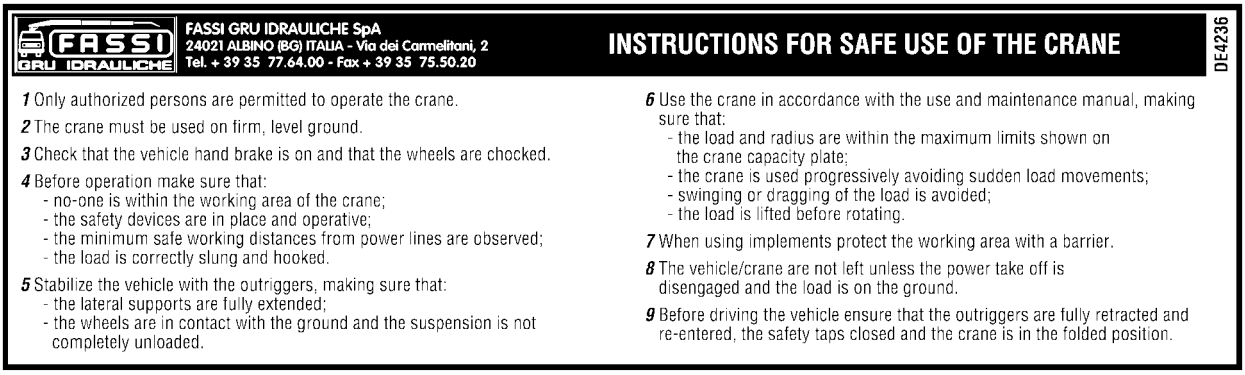
Use the crane in accordance with the use and maintenance manual, making sure that:
- the load and radius are within the maximum limits shown on the crane capacity plate;
- the crane is used progressively avoiding sudden load movements
- swinging or dragging of the load is avoided;
- the load is lifted before rotating.

When using implements protect the crane working area with a barrier.

The vehicle/crane are not left unless the power take off is disengaged and the load is on the ground.

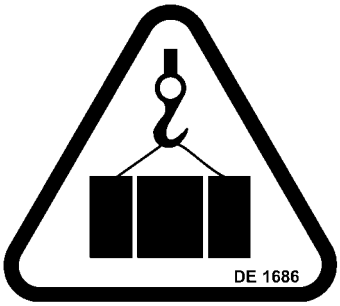
Before driving the vehicle make sure that the outriggers are fully retracted and re-entered, the safety taps closed and the crane is in folded position.

fig. 1



C0 WARNING AND INSTRUCTIONS

The use of the crane is reserved to authorized personnel, instructed in advance, who has to conform to the safety norms and instructions contained in the use manual supplied with the crane. (See norms ISO 9926-1)

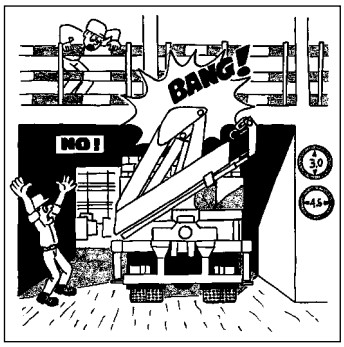


It is absolutely prohibited to walk or stop under a suspended load

It is prohibited for unauthorized persons to be within the working area.

Under no circumstances interfere with the safety and protection devices.

Warning plates, as well as instruction and operation plates must be replaced when no longer readable or missing. See Paragraph R0 Instruction and warning plates.



Do not use the outriggers to raise the vehicle.

To avoid hitting bridges or tunnels check and record the overall height of your crane in the folded position or in laid position in the body or on the load. Always respect and pay proper attention to road signs placed in proximity of such obstacles.

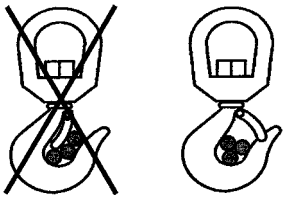
C0.1 Before operating

Check that protections are in their place and that all safety devices are fitted and active. (See norms ISO 9927-1)

Keep the ladder and the control station on the top seat, clean; the seat can tilt forward.

Make sure that control stations are properly lit so as to ensure safety while operating and allow instruction plates to be visible.

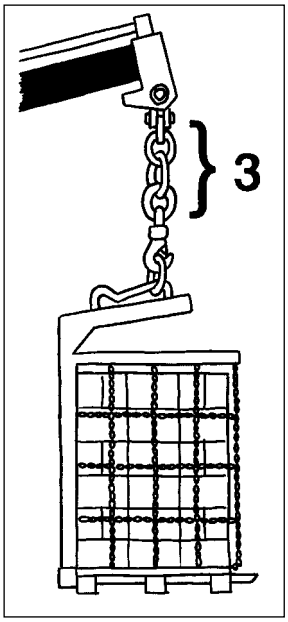
Check that the working area is adequate and properly lighted for your crane.



Make sure that the hook is always free to rotate on its pin and that nothing obstructs its vertical positioning.

Check the efficiency of the hook safety catch.

Carefully inspect the condition of ropes or chains.



Make sure that the pallet fork is connected to the crane hook by means of a chain having at least **three (3)** rings.

C0.2 During operation

Take the vehicle fumes away from the working area by fitting an extension tube of a suitable diameter to the exhaust system.
Do not run the engine in a indoor area without first making sure there is adequate ventilation.

When using the ladder to reach the control station on the top seat, avoid knocking into the controls while going up or down the ladder.

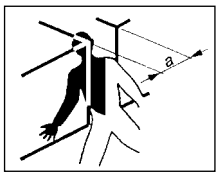
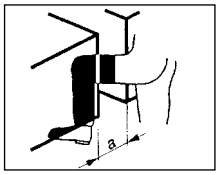
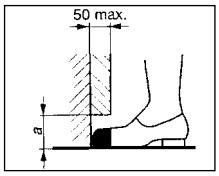
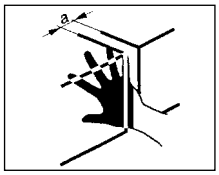
The control station on the top seat is provided with side safety guards; stay within these guards.

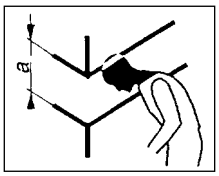
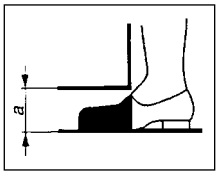
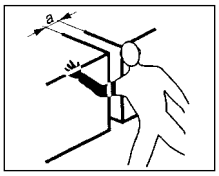
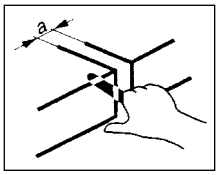
Make sure that no one is within the working area of the crane.

Avoid swinging the load above working and transit areas; any hidden danger situation must be audibly alarmed.

Avoid all those situations which may result in crushing during vehicle stabilization, crane movement and load handling.

(In conformity with EN 349 standard the minimum safe working distances to avoid crushing parts of the body)

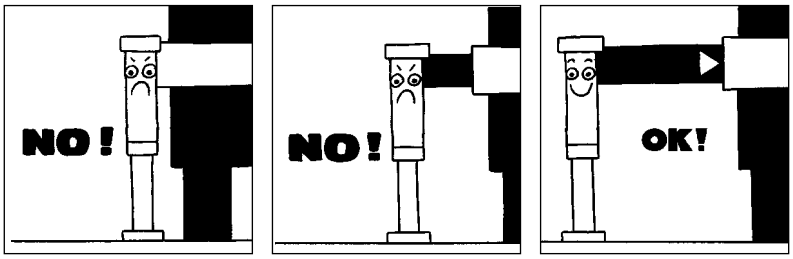
Parts of the body	Minimum safe working distance mm	Figure
Body	500	
Leg	180	
Toes	50	
Hand Wrist Fist	100	

Parts of the body	Minimum safe working distance mm	Figure
Head	300	
Foot	120	
Arm	120	
Finger	25	

The table indicates the minimum safety working distances concerning the various parts of the body.
The figures illustrate circumstances which may turn out to be dangerous if you fail to respect the minimum safe distances and if it is impossible to introduce larger parts of the body.

(!) WARNING (!)
Failure to respect the minimum safe distances may result in a safety hazard and a deadly risk.

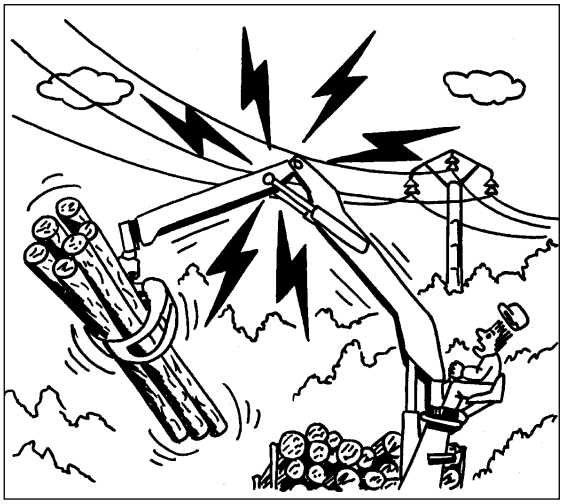
Remember that the stability of the unit (crane-vehicle) is only guaranteed by the complete lateral extension of the outriggers and by the observance of the capacity plates.



Stabilize the vehicle, checking that the outrigger rams rest on a solid base; if necessary use larger outrigger base plates (available on request) to avoid sinking. If you adopt other means, make sure that they are suitably sized for the load they must bear.

Check that the angle of inclination of the vehicle does not exceed five (5) degrees from horizontal.

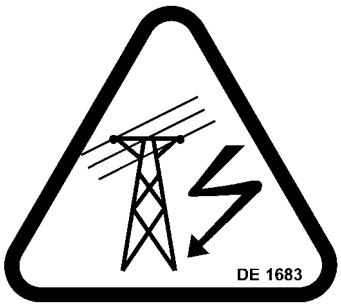
(!) WARNING (!)
Respect the distances di sicurezza from electric lines; the minimum distance is, according to CEN norms, five (5) meters, except for otherwise prescribed by national norms.



(!) WARNING (!)
Failure to respect the minimum safe distances may result in electrical hazards for the operator and his assistants.

(!) WARNING (!)
Do not utilize the crane with wind speed exceeding 12,5 m\s (value 6 of the Beaufort scale).

(!) WARNING (!)
Carefully inspect the load rigging.

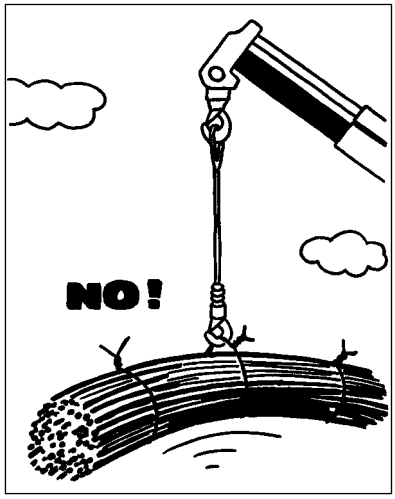


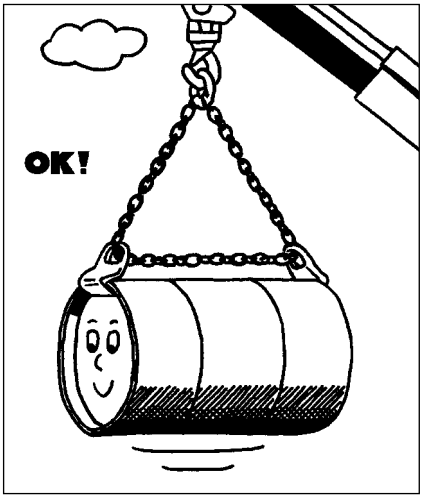
Hook up the load, checking that it does not exceed the capacity indicated on the lifting diagram specific to each load configuration.

Make sure that the lifted load is balanced.

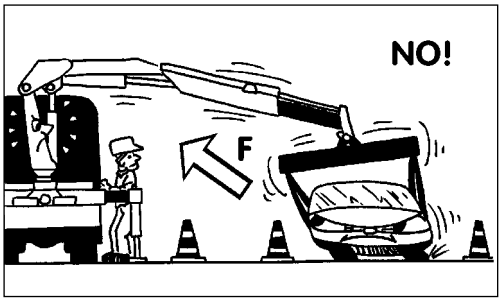
Avoid swinging the load above the control station; in cases where the load is too close, the crane must be operated from the opposite side.

When operating through a winch, lift the load vertically using the cable and not the booms in order to avoid swinging the load.



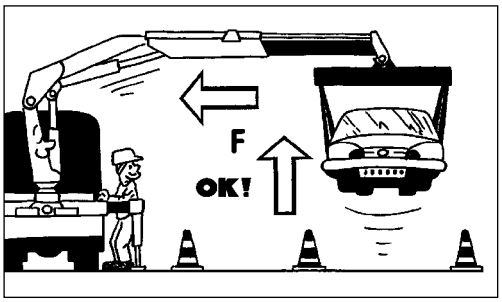


Do not rotate the crane before the load is lifted.



Do not operate with sudden movements, activate the controls with slow and progressive movements; rotate slowly and with care paying attention to the stability of the vehicle.

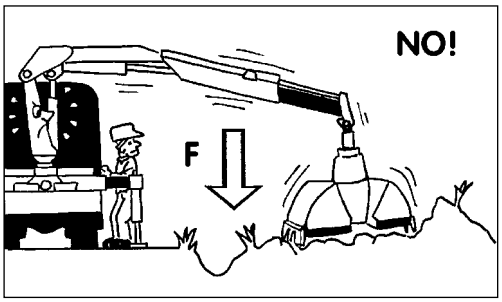
With vertical lift, on hydraulic and mechanical extension, rotate slowly in order to avoid side-skidding.



(!) ATTENTION (!)
Do not utilize the crane for pushpull, lateral or sideways operations.

(!) WARNING (!)
Crushing or push manoeuvres are not permitted.

(!) Never operate the outriggers when the crane is loaded.



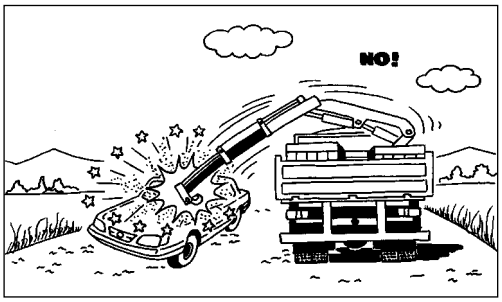
(!) WARNING (!)
The vehicle\crane must not be left unless the load is on the ground, the booms of the crane (and of the hydraulic jib), are folded and laid on a solid base and the power take-off is disengaged.

Do not move the vehicle if a load is suspended on the crane.

C0.3 At the end of the operation (Prior to driving the vehicle)

Fold the crane.

If the booms of the crane of the crane (or of the hydraulic jib) are to be laid on the body or on the load, they must be suitably blocked to prevent possible sideways movements.



Make sure that the indications about the overall dimensions are respected.

NOTE
Implements can be left mounted on the booms of the crane (or of the hydraulic jib) only if the overall dimensions are respected; they must be suitably blocked to prevent possible sideways movements.

Make sure that the outrigger supports and rams are re-entered within the overall width of the truck and locked by the safety devices.

Disengage the power take off.

D0 CLASSIFICATION OF THE CRANE MODEL

The design of this crane has been carried out in respect of **DIN 15018** norms, fatigue test classification **H1B3**.

The crane can operate, intermittently, with lifting devices other than the hook.

The dimensions and the capacity of the implements must be proportioned with crane performances.

D0.1 Technical data

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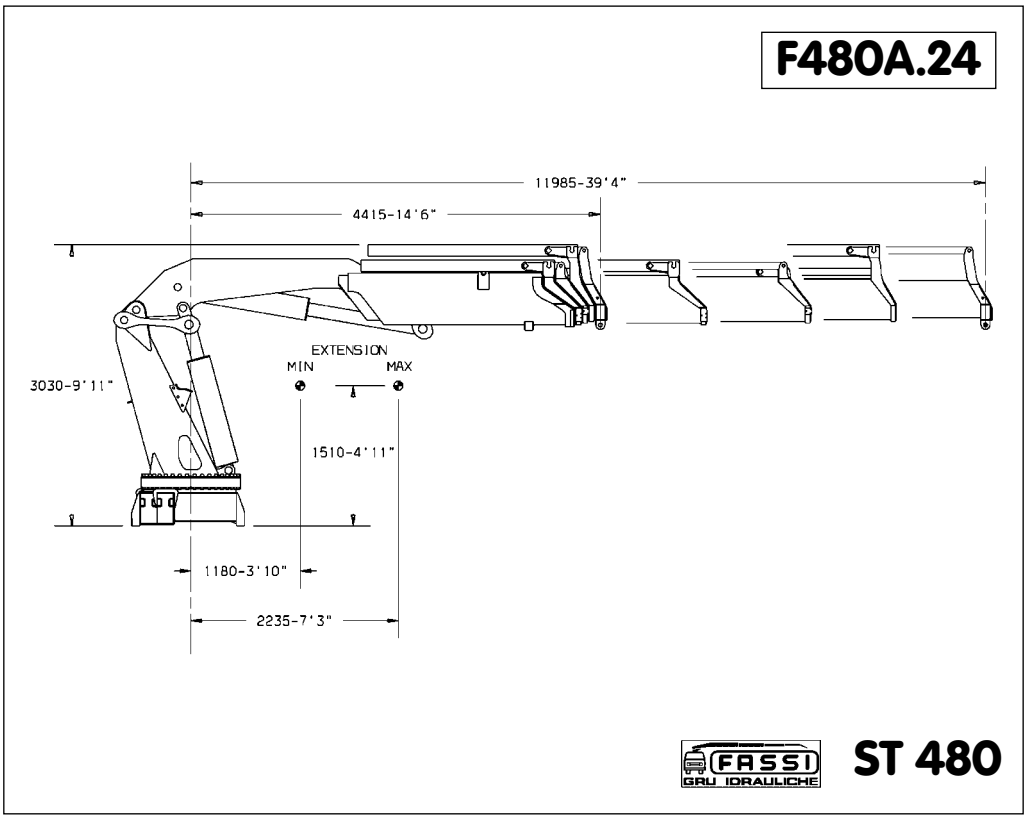
Lifting capacity	Standard reach	Hydraulic extension	Rotation arc	Rotation torque	Working pressure	Pump capacity	Oil tank capacity	Crane weight	Max. working pressure on the outrigger (Φ 210)
45,1 tm 442,4 kNm	**12,00 m**	**7,55 m**	**360°**	**4,59 tm 45 kNm**	**30,5 MPa**	**70 l/min**	**200 l**	**5400 kg**	**59 daN\cm²**



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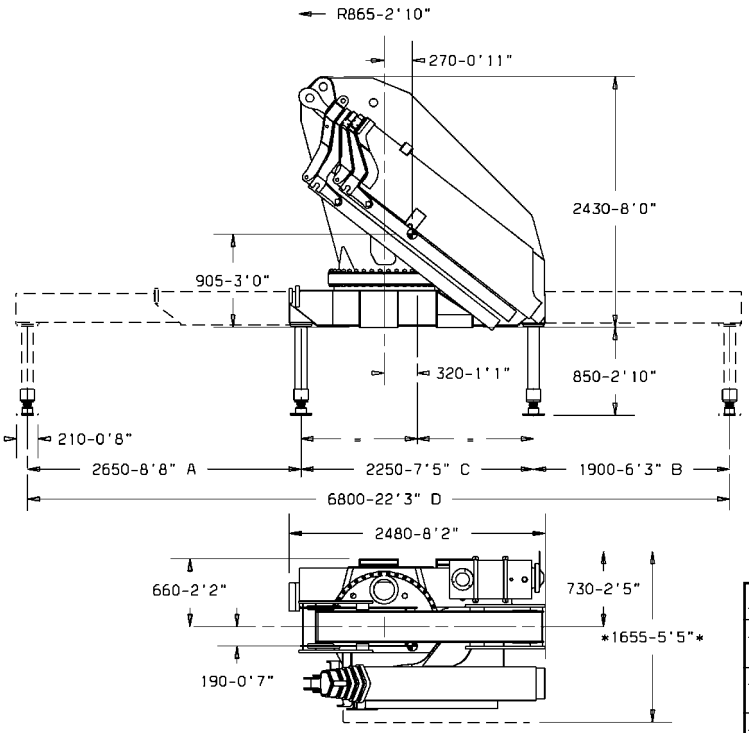
EXTRA		
A	**2950**	**9' 8"**
B	**2800**	**9' 2"**
C	**2250**	**7' 5"**
D	**8000**	**26' 3"**



— MEZZERIA TIRANTI
— FIXING ROD CENTER DISTANCE
— LIGNE MEDIANE TIRANTS
— ABMESSUNG DER BEFESTIGUNGSBRIDEN
M39 x 3

FASSI GRU IDRAULICHE **ST 480**

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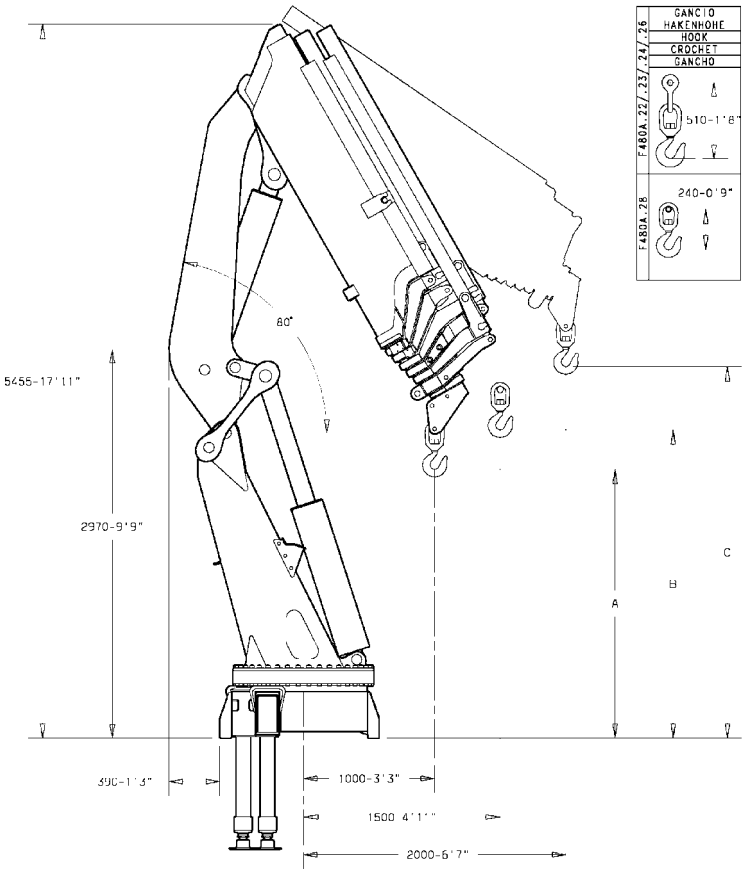


	A		B		C	
F480.22	2510	8'3"	2940	9'8"	3945	12'11"
F480.23	2420	7'11"	2825	9'3"	3660	12'0"
F480.24	2340	7'8"	2730	8'11"	3470	11'5"
F480.26	2190	7'2"	2545	8'4"	3170	10'5"
F480.28	2050	6'9"	2355	7'9"	2840	9'4"

MASSIMA ALTEZZA SOTTOGANCIO.
HAUTEUR MAXIMUM SOUS CROCHET.
MAXIMUM HOOKING POSITION.
MAXIMALHOEHE BIS KRANHAKEN.

FASSI GRU IDRAULICHE **ST 480**

D1 IDENTIFICATION OF THE CRANE MODEL

The exact **crane model, serial number** and description of **implements** will enable **FASSI Service Department** to give a rapid and efficient response.

D1.1 CE Crane mark

The CE indicates that the crane complies with the Machines Directive (D.M.) 98/37; it can be considered effective only with a written declaration of conformity enclosed. The crane affixed with the CE mark is supplied with a lifting moment limiting device to preserve the crane structure from overloads.

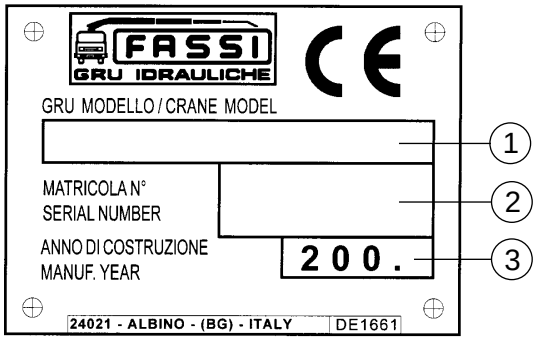


fig. 2

Identification data are marked on the plate DE1661 used for the CE mark (fig. 2) and fixed on the base

1 - Crane model
2 - Serial Number
3 - Year of manufacturing

The crane must not be put into service within the European Community unless the machine on which it is mounted also conforms with the prescribed Directive. Ever change of use, modification or addition of accessories, not specified by this manual must be affixed with a new CE mark in accordance with the Machinery Directive.

A further metallic plate (fig. 3) fixed to the crane by the installer, quotes the identifying data of the equipment and the final CE mark.

1 - Name of the installer who applied the final CE mark
2 - Crane mark, model and serial number
3 - Vehicle mark, model and chassis number
4 - Year of mounting

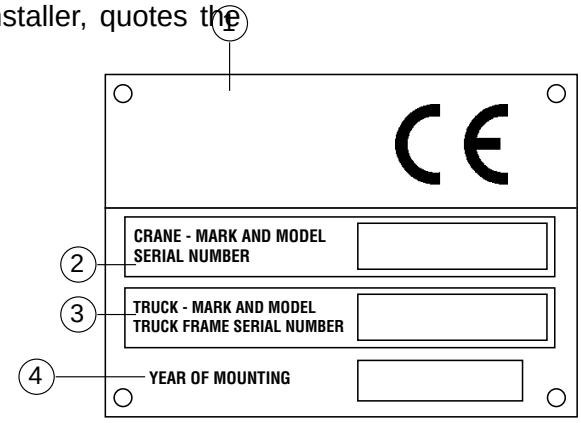


fig. 3

D1.2 Crane mark

Identification data of the crane are marked on the plate DE2141 and fixed on the base. (fig. 4)

1 - Crane model
2 - Serial Number
3 - Year of manufacturing

(!) UNDER NO CIRCUMSTANCES SHOULD THE DATA MARKED ON THE PLATES BE ALTERED.

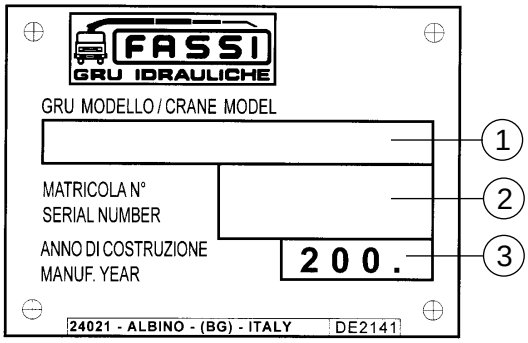


fig. 4

E0 CRANE NOMENCLATURE

E0.1 Crane with ground controls (fig. 5).

Pos.	Description
1.	Outrigger rams
2.	Outrigger supports
3.	Base
4.	Slew ring
5.	Rotation motoreducer
6.	Deviator crane - outriggers
7.	Dual control for deviator crane - outriggers
8.	Multifunction deviators
9.	Distributor bank
10.	Double control
11.	Column
12.	Inner ram
13.	Inner boom
14.	Outer ram
15.	Outer boom
16.	Booms extension rams
17.	Extension boom sections
18.	Lifting hook
19.	Oil tank
20.	Manual extensions (optional)

E0.2 Crane with top seat controls and with ground controls for outriggers. (fig. 6)

Pos.	Description
1.	Outrigger rams
2.	Outrigger supports
3.	Base
4.	Slew ring
5.	Rotation motoreducer
6.	Deviator crane - outriggers
7.	Dual control for deviator crane - outriggers
8.	Multifunction deviators
9.	Column
10.	Seat
11.	Distributor bank
12.	Inner ram
13.	Inner boom
14.	Outer ram
15.	Outer boom
16.	Booms extension rams
17.	Extension boom sections
18.	Lifting hook
19.	Oil tank
20.	Manual extensions (optional)

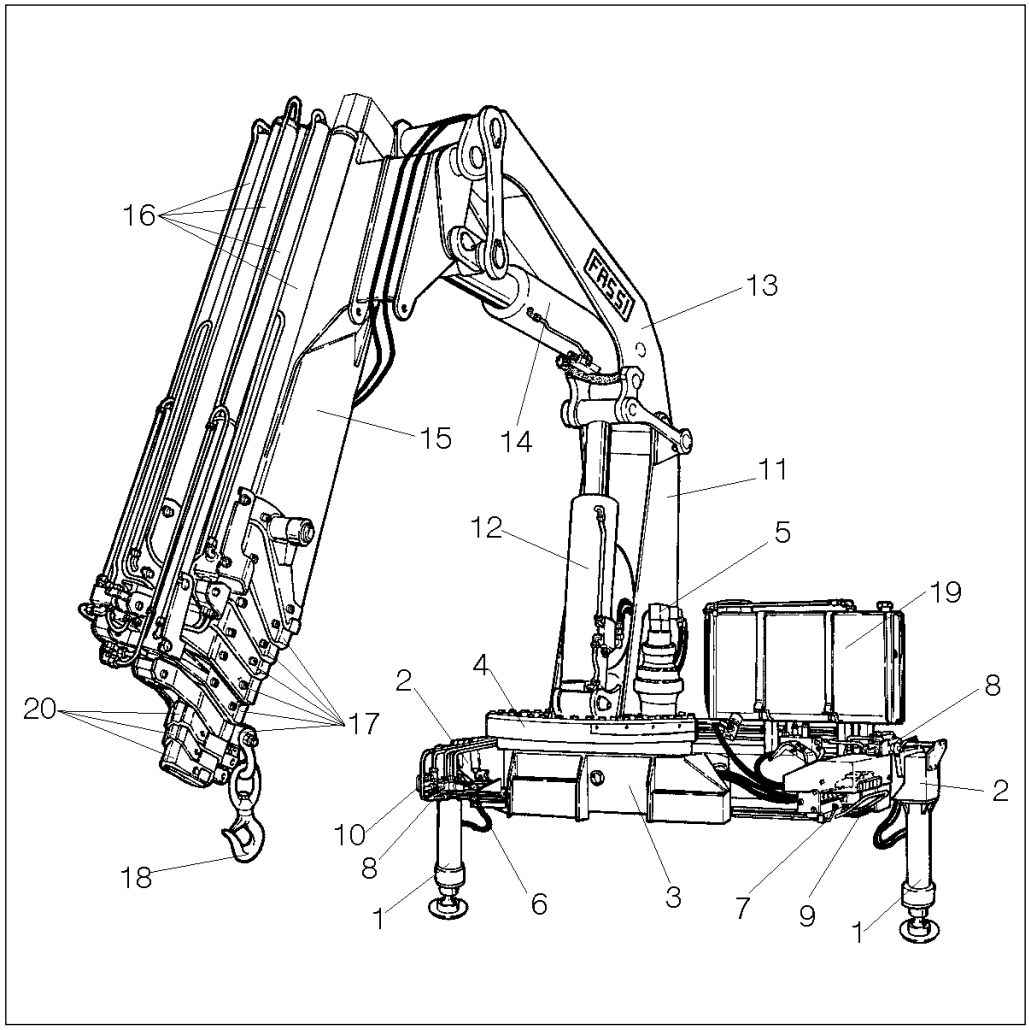
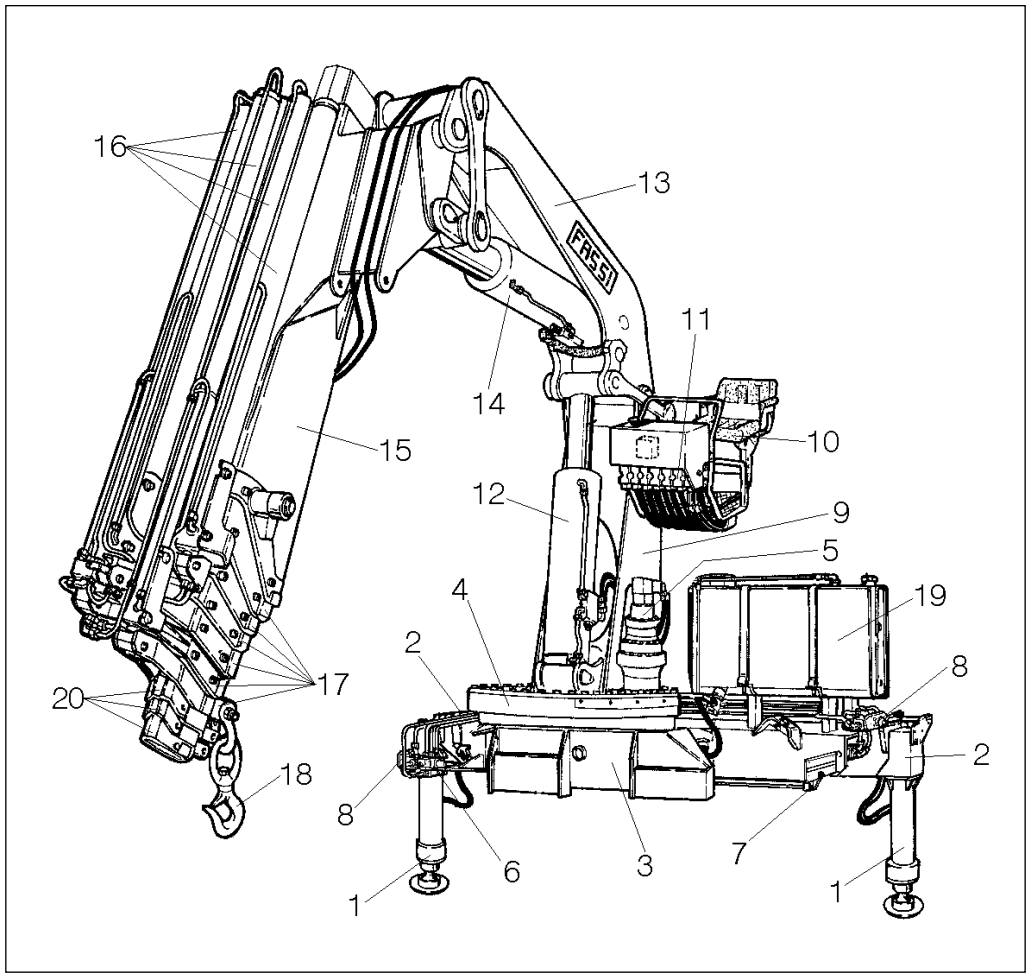

16
13
15
14
11
12
5
19
4
2
8
20
17
2
10
8
18
1
6
3
7
9
1

fig. 5


16
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1
1

fig. 6

F0 CE NOMENCLATURE OF THE SAFETY AND PROTECTION DEVICES

F0.1 Crane with ground controls (fig. 7).

Pos.	Description
1.	Check valves for outrigger rams
2.	Check valves for rotation control (flow regulators)
3.	Check valve for inner ram
4.	Check valve for outer ram
5.	Check valve for booms extension rams
6.	Lifting moment limiting device assembly
7.	Control panels
8.	Parachute valves
9.	Rotation limiting device (optional)
10.	Main pressure valve (outriggers)
11.	Main pressure valve (crane)
12.	Auxiliary valves (crane)
13.	Levers guard
14.	Safety device for outriggers supports
15.	Hook safety device
16.	Exclusion tap lever

F0.2 Crane with top seat controls and with ground controls for outriggers. (fig. 8)

Pos.	Description
1.	Check valves for outrigger rams
2.	Check valve for rotation control
3.	Check valve for inner ram
4.	Check valve for outer ram
5.	Check valve for booms extension rams
6.	Lifting moment limiting device assembly
7.	Control panel
8.	Parachute valves
9.	Rotation limiting device (optional)
10.	Main pressure valve (outriggers)
11.	Main pressure valve (crane)
12.	Auxiliary valves (crane)
13.	Levers guard
14.	Safety device for outriggers supports
15.	Hook safety device
16.	Exclusion tap lever

Before crane use check that safety and protection devices are fitted and active.

Under no circumstances interfere with the safety and protection devices.

Interference with the check valves and removal of the lead seal remove the Manufacturer and invalidate the warranty.

Use the ladder for the access to the top seat.

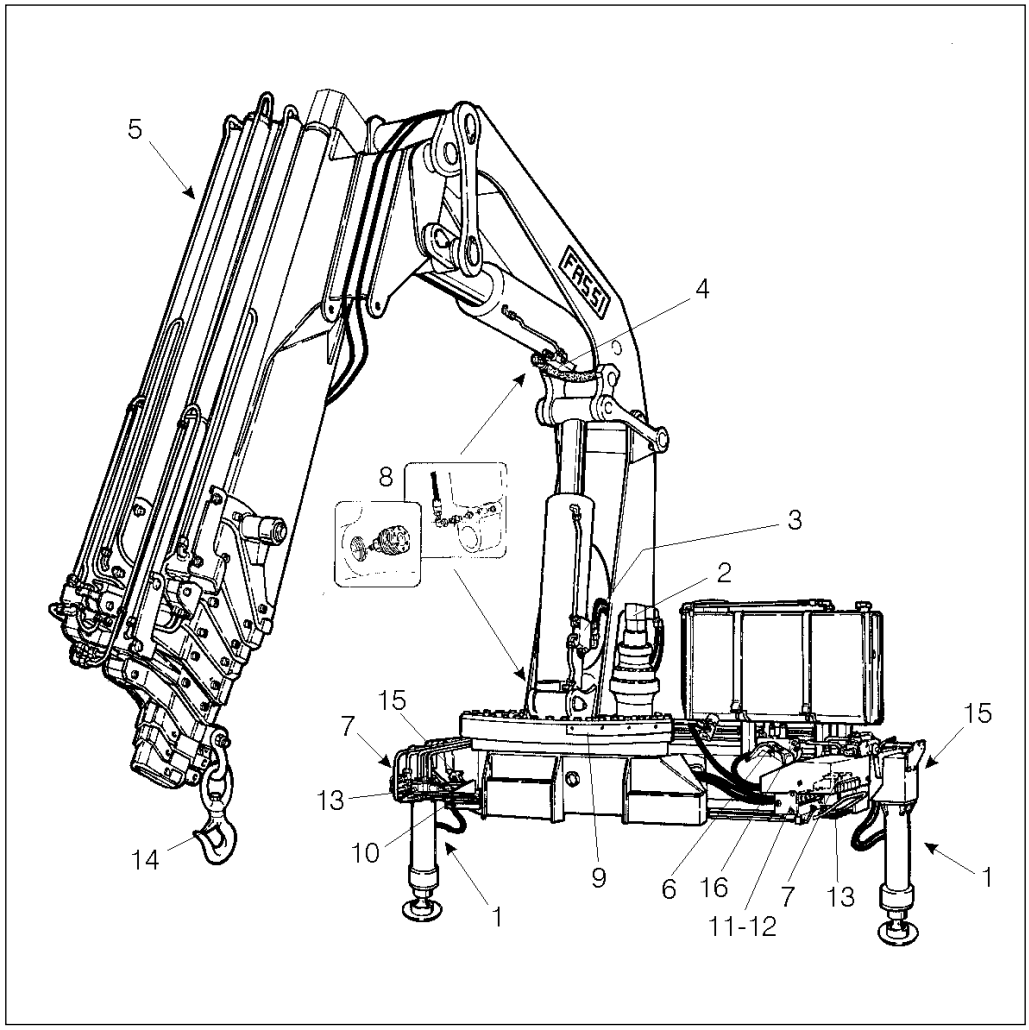
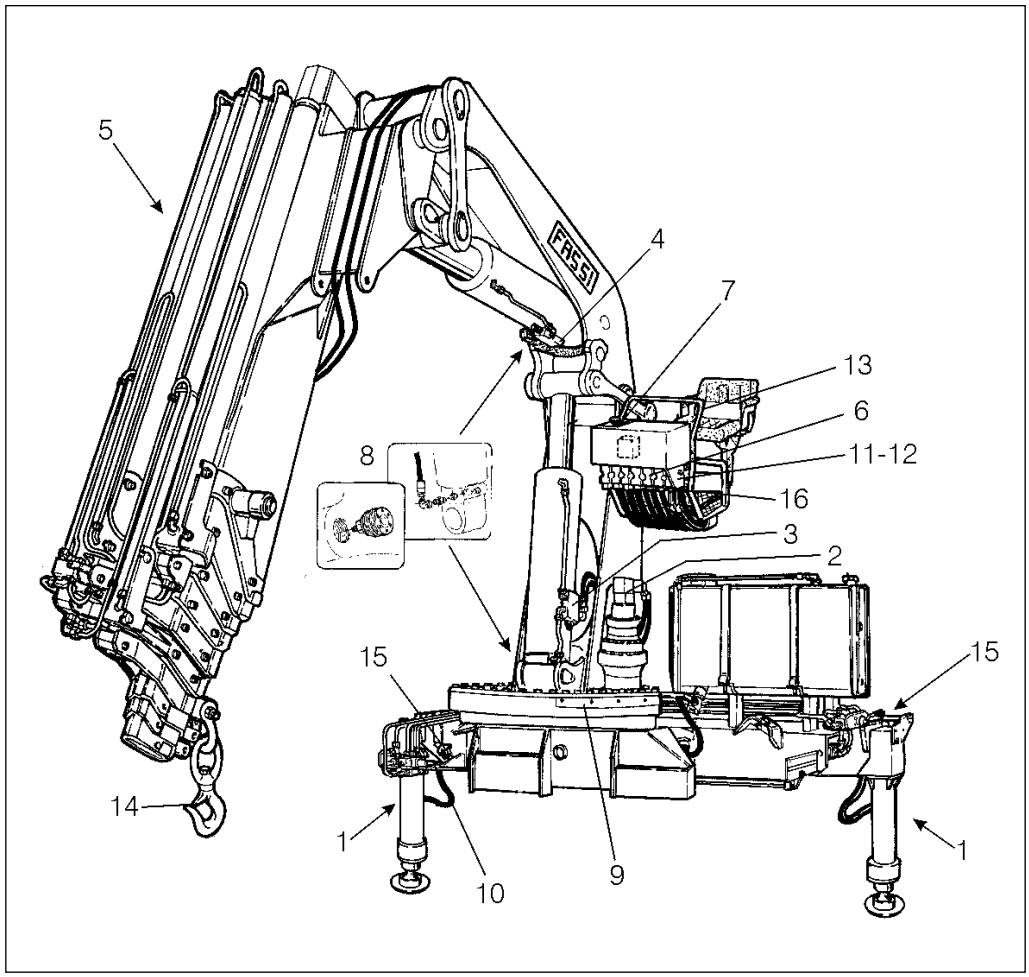

5
4
8
3
2
15
7
13
10
14
1
9
6
16
11-12
15
1
7
13

fig. 7


5
4
7
13
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11-12
16
8
3
2
15
15
14
1
10
9
1

fig. 8

F1 NOMENCLATURE OF THE SAFETY AND PROTECTION DEVICES

F1.1 Crane with ground controls (fig. 9).

Pos.	Description
1.	Check valves for outrigger rams
2.	Check valves for rotation control (flow regulators)
3.	Check valve for inner ram
4.	Check valve for outer ram
5.	Check valve for booms extension rams
6.	Main pressure valve (outriggers)
7.	Main pressure valve (crane)
8.	Auxiliary valves (crane)
9.	Levers guard
10.	Safety device for outriggers supports
11.	Hook safety device
12.	Lifting moment limiting device assembly
13.	Parachute valves
14.	Exclusion tap

F1.2 Crane with top seat controls and with ground controls for outriggers. (fig. 10)

Pos.	Description
1.	Check valves for outrigger rams
2.	Check valve for rotation control
3.	Check valve for inner ram
4.	Check valve for outer ram
5.	Check valve for booms extension rams
6.	Main pressure valve (outriggers)
7.	Main pressure valve (crane)
8.	Auxiliary valves (crane)
9.	Levers guard
10.	Safety device for outriggers supports
11.	Hook safety device
12.	Lifting moment limiting device assembly
13.	Parachute valves
14.	Exclusion tap

Before crane use check that safety and protection devices are fitted and active.

Under no circumstances interfere with the safety and protection devices.

Interference with the check valves and removal of the lead seal remove the Manufacturer and invalidate the warranty.

Use the ladder for the access to the top seat.

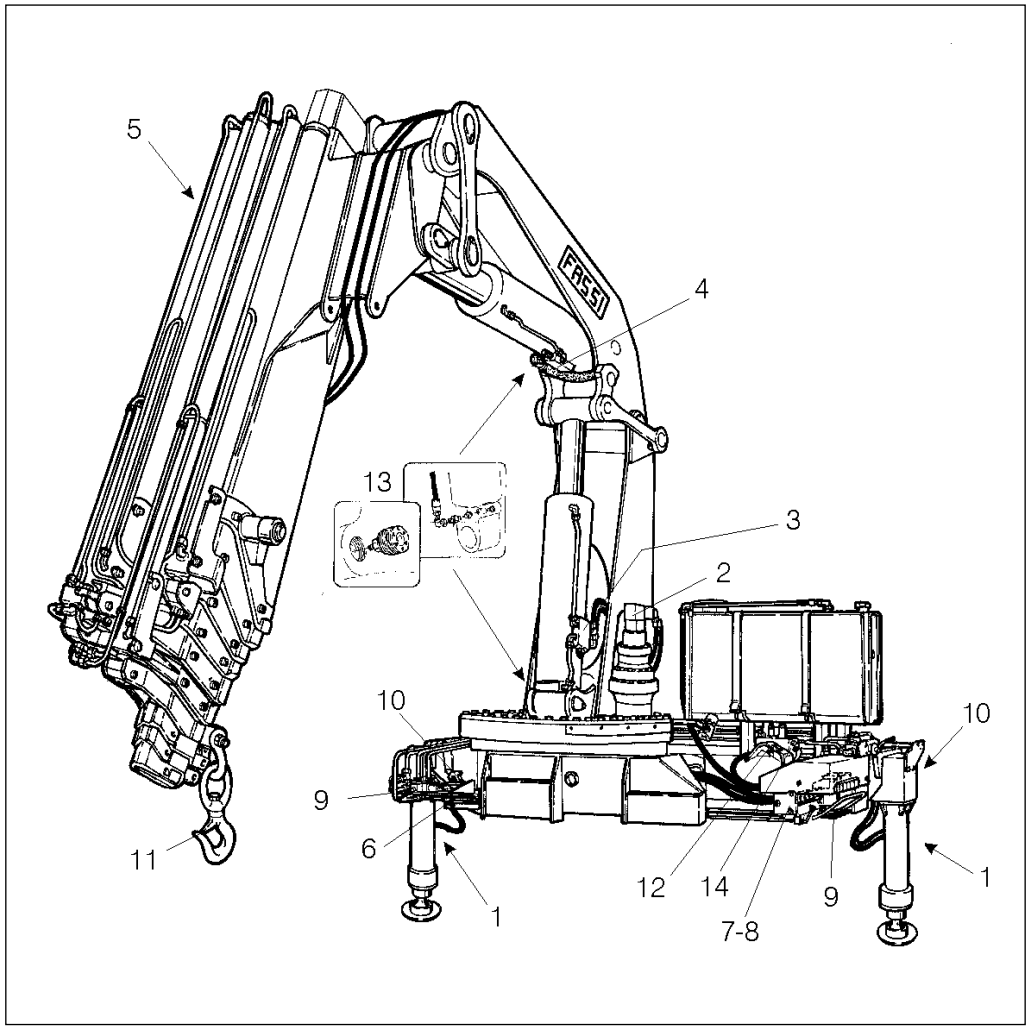


fig. 9

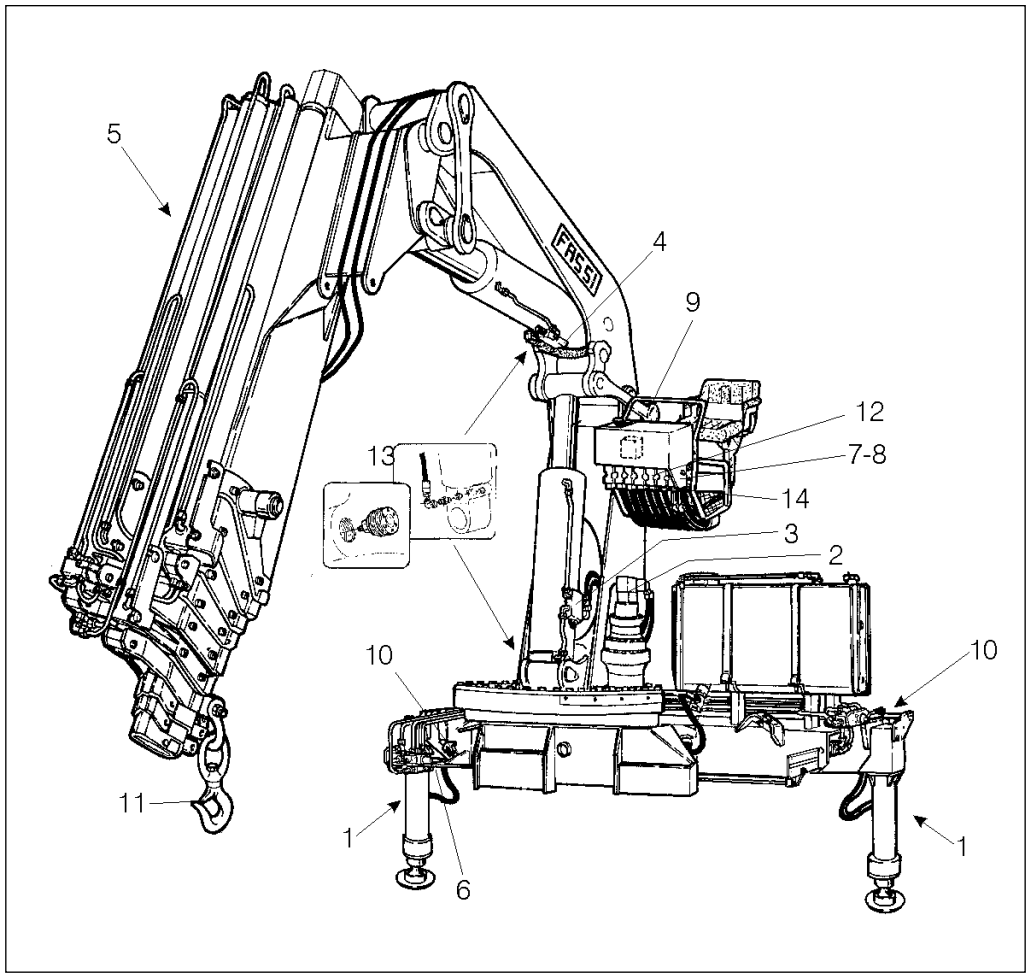


fig. 10

G0 SUPPLEMENTARY BEAMS

Supplementary beams are used in conjunction with the crane outriggers to ensure the vehicle stability during load handling.

Code	outrigger ram stroke mm	outrigger interaxis mm	extension type	Weight Kg
330B054	520	4984	Hydraulic-“H” variable	520
750B055	520	5770	Hydraulic-“H” variable	840
750B053	520	6870	Hydraulic-“H” variable	930
330B055	340	4984	Hydraulic-“H” variable	490
750B054	340	5770	Hydraulic-“H” variable	810
750B043	340	6870	Hydraulic-“H” variable	900

G0.1 Identification of the supplementary beams

Identification data of the supplementary beam is punched on the beam (fig. 11) in the following sequence:

Ex. ***330B054*0001**
- serial no.
- identification code

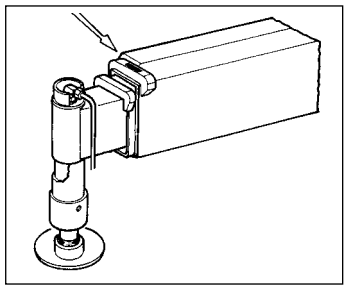


fig. 11

G1 TILTABLE OUTRIGGER RAMS

Outrigger rams are allowed to be stored in an inclined position, when obstructions on the vehicle chassis prevent their vertical stowability. These hinged supports are placed between the outrigger supports and the rams; the fixed part is screwed to the supports while the mobile part is screwed to the rams. (fig. 12-12a)

fig. 12

To place the rams in a working condition.
- Supporting the ram, remove the check pin and the locking pin from their positions.
- Position, carefully, the ram in working condition, insert the locking pin in its new position and secure it with the check pin.

To re-position the rams to the folded position.
- Remove the check pin and the locking pin.
- Position, the ram in a upward direction and supporting the ram, insert
- the locking pin in its new position and secure it with the check pin

fig. 12a

(!) The locking pin is constructed from special material
- do not replace it with a non original part
- your security depends on it

G2 MANOEUVRES AND CONTROLS TO STABILIZE THE VEHICLE

The outriggers rams prevent damaging stresses both to the frame and to the vehicle suspensions on which the crane is mounted to and assure the stability of the unit during load handling.

Be very careful when stabilizing the vehicle; make sure that no one is or transits in close proximity of the working area of the outriggers.

(!) ATTENTION (!)

The crane stability is maintained by the maximum extension of the outrigger supports, by the solidity of the base underneath the plates of the outrigger rams and by the observance of the capacity plates. To check the maximum working pressure see Paragraph D0.1 Technical data

Check that the outrigger rams are applied on a solid base; if necessary use larger outrigger base plates (available on request) to avoid sinking.

When stabilization is complete the wheels of the vehicle must still be in contact with the ground and the suspensions must not be fully unloaded.

Level the crane so as to operate on a horizontal plane; check that the angle of inclination of the vehicle does not exceed five (5) degrees from horizontal.

While loading, it may be necessary to vertically adjust the outrigger rams to prevent an overload on the outriggers, then stabilize again.

While unloading, the outrigger rams may not be perfectly in contact with the ground because of a rise in the suspension; it is therefore recommended to stabilize the vehicle during operation to avoid an overturn.

G2.1 Functions of control levers for stabilization

The controls to stabilize the vehicle are activated only from ground level and on both sides of the crane base.

Lever function D - C (fig. 15-15a-15b)

Levers **D** Control for deviator and deviator transmission crane-outriggers (- **E/S**).

Levers **C** Control for multifunction deviator and multifunction transmission for selecting and operating the supports and the outrigger rams.

fig. 15

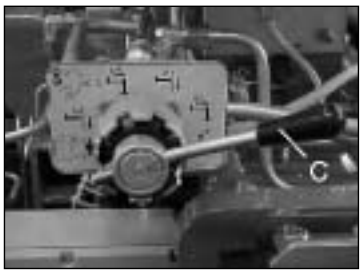


fig. 15a

Operate the levers clockwise to select the control (multi-function deviator) and in alternate direction to operate the required function (ram).

The deviator and the multifunction transmission are fitted with lever guide which ensures accurate selection and operation.

fig. 15b

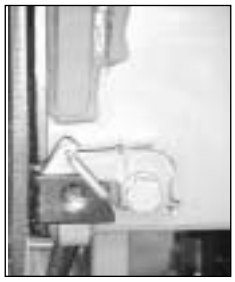


fig. 14

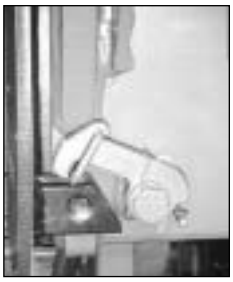
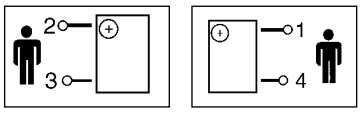


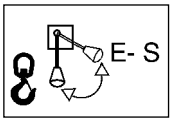
fig. 14a

NOTE The graphic symbols illustrated hereunder are marked on the plates affixed on the deviator and on the dual or remote side and indicate with the following symbolism

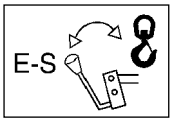
They indicate the position of the operator in relation to the vehicle and the crane.



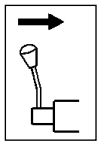
Lever **D**
Deviator
- **E/S**



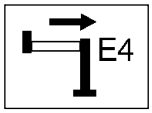
Lever **D**
Double control
Deviator - **E/S**



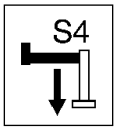
Lever **C**
Multifunction
Deviator and
Double control



Hydraulic
extension
control



Outrigger
ram control



See Paragraph R0 Instruction and warning plates.

Disengage the locking devices of the outrigger supports by putting the levers **A** from the position of the fig. 14 to the one of the fig. 14a.

Position lever **D** of oil diverter (- **E/S**) on **E/S**.

G2.2 CE Controls to stabilize the vehicle

The controls conform with the safety directives and enable the operator to activate the lateral extension of the outrigger supports and rams only from the side where he can visually check the operation.

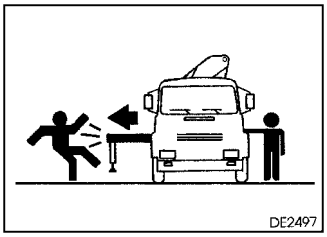
- Exit of the outrigger support; position the lever **C** on the corresponding position and then, activate the control.
- Outrigger ram descent; position the lever **C** on the corresponding position and then, activate the control.

Note The levers, if placed on positions different from the ones indicated on the plates on the deviator and the multifunction transmission do not allow any operations because the safety devices have disabled them.

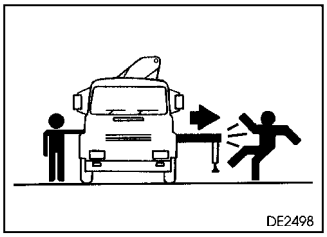
G2.3 Bilateral controls to stabilize the vehicle

The special fitment adopted allow the activation of the multifunction deviator only from ground level and on both sides of the vehicle. Make sure that no one is or transits in close proximity of the working area of the outriggers specially in the case that the outrigger control is executed from the opposite side of the vehicle (it is not possible visually check the operation).

- Exit of the outrigger support; position the lever **C** on the corresponding position and then, activate the control.
- Outrigger ram descent; position the lever **C** on the corresponding position and then, activate the control.



(!) ATTENTION (!)
During the stabilising operations, for each outrigger ram, it is recommended to DESCENT the outrigger as the last manoeuvre.



(!) ATTENTION (!)

The complete extension of the outrigger supports is visually indicated by the yellow triangles which are found at the end of the beam (Fig. 14b)

The stabilization has to be carried out with care and gradually keeping the vehicle in horizontal levelled condition to prevent springs overloads and chassis torsions.

To operate the crane controls, after having completed the descent and stabilisation manoeuvres,

- Position lever **D** of oil diverter (- **E/S**) on .

Manoeuvres for re-entry of the crane outriggers and supplementary outriggers within the overall vehicle width after crane use.

- Position lever **D** of oil diverter (- **E/S**) on **E/S**.

Repeat by inverting the sequence of the operations.

fig. 14b

(!) WARNING (!)

Keep hands clear of automatic stop device of the outrigger supports (lever A from the position of the fig. 14a to the one of the fig. 14).

(!) Always check that the outrigger supports, once in their rest position, are locked in their seat by the safety devices, so as to assure the impossibility of accidental movement. (fig. 14).

H0 CONTROLS TO OPERATE THE CRANE

(!) WARNING (!)
Before operating the crane it is compulsory to set the outriggers. (Plate DE2327 fig. 16)

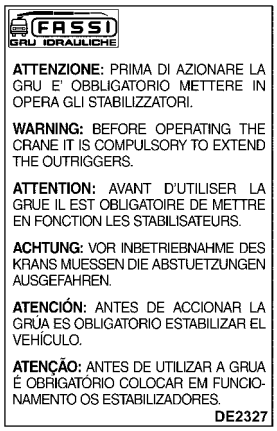
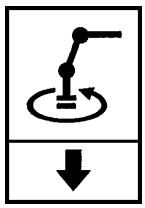


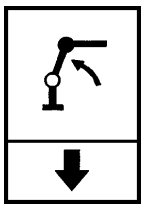
fig. 16

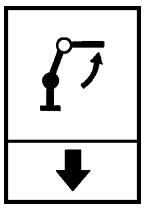
The crane and hydraulic implements can be manually operated with:
- ground controls on both sides or, on request ground controls on both sides and top seat controls by hand-cables;
- top seat controls;
- radio remote control.

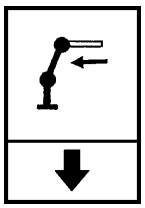
The plates reported over each lever define their function in relation to their movement.

CRANE CONTROLS

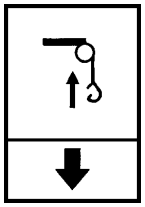

Rotation

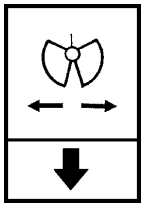

Inner boom


Outer boom

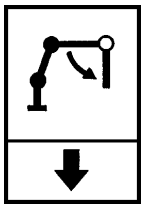

Extension booms

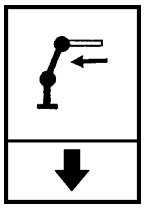
IMPLEMENTS CONTROLS
1 Additional function


Winch

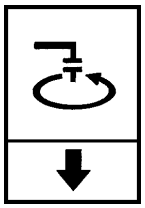

Bucket

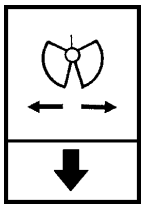
IMPLEMENTS CONTROLS
2 Additional functions


Jib outer boom

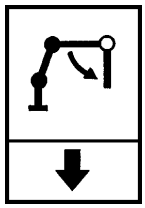

Jib extension booms

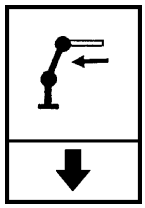
IMPLEMENTS CONTROLS
2 Additional functions

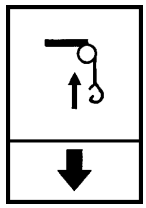

Rotator


Bucket

IMPLEMENTS CONTROLS
3 Additional elements


Jib outer boom


Jib extension booms


Winch

(!) ATTENTION (!)
The sequence of the plates placed on the crane controls may be different.

Make sure that the lever you are going to operate correspond to the control you selected.

(!) Operate the levers smoothly and gradually (!)
When carrying out simultaneous movements of two or more functions, also related to pump flow and lever travel, it is possible that on reaching the stroke end of a particular function, an increase in speed of the other functions will occur.

(!) WARNING (!)
While exiting and folding the crane, you must operate from the distributor side; it is forbidden to operate from the double control side because of the overall dimensions of the booms. (DE1684A fig. 17)

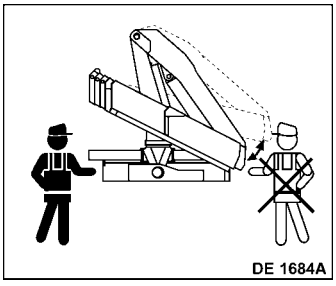
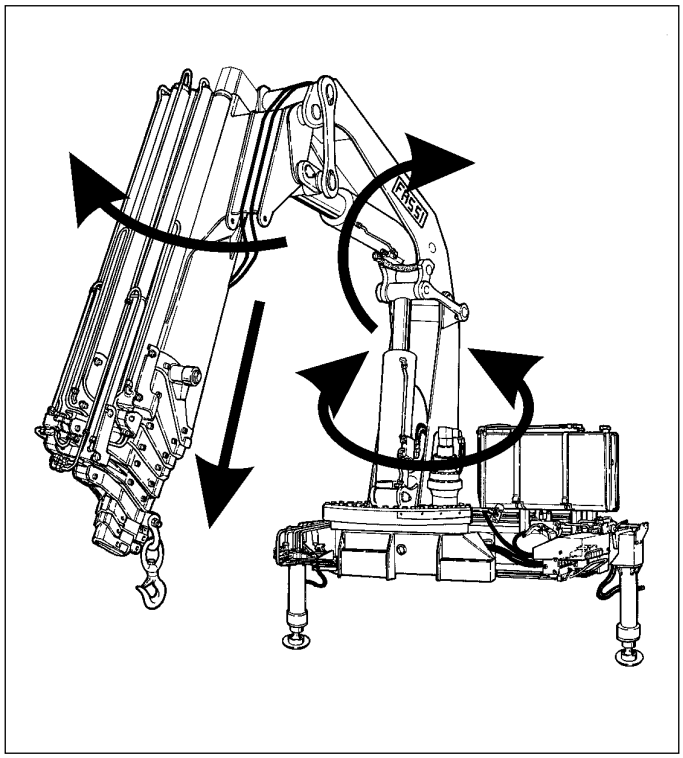


fig. 17

H0.1 Manoeuvres to unfold the crane into a working condition

- Engage the power take off.
- Stabilize the vehicle (see details on Paragraph G2 “Manoeuvres and controls to stabilize the vehicle”).



(!) IT IS FORBIDDEN TO OPERATE FROM (!) THE DOUBLE CONTROL SIDE

(!) Operate from ground control distributor side (!)

By operating the corresponding levers:
- make sure that the extension booms and the outer ram are closed;
- lift the inner boom over the horizontal line;
- open the outer boom to the “horizontal” position;

- position the hook on the vertical line above the load.

H0.2 Manoeuvres to fold the crane into the rest condition

(!) IT IS FORBIDDEN TO OPERATE FROM (!) THE DOUBLE CONTROL SIDE

(!) Operate from ground control distributor side (!)

By operating the corresponding levers:
- fold the extension booms to their stroke end;
- lift the inner boom to its stroke end;
- fold the outer boom to its stroke end;
- rotate the crane until the arrows coincide (on the base and on the slew ring);
- fold the inner boom to its stroke end; the rest locating pin locates into its seat;
- re-position the outriggers to within the overall vehicle width as described on Paragraph G2.

H1 CE MANOEUVRES OF THE CRANE LOADS

(!) Before manoeuvering the load, verify that the working area is suitable for your crane.

The lifting curves of the capacity plate indicate the maximum load that the crane can lift at a certain radius and at a certain height. To utilize the maximum capacity of the crane, it is necessary to position the inner boom as indicated on the capacity plate. During load handling, do not exceed the reach limits given, or the load indicated on the above mentioned charts. If the limits are exceeded, the load limiting device, allowing all manoeuvres, which reduce the lifted load within the permitted reach limits and forbid all other manoeuvres, will be immediately activated.

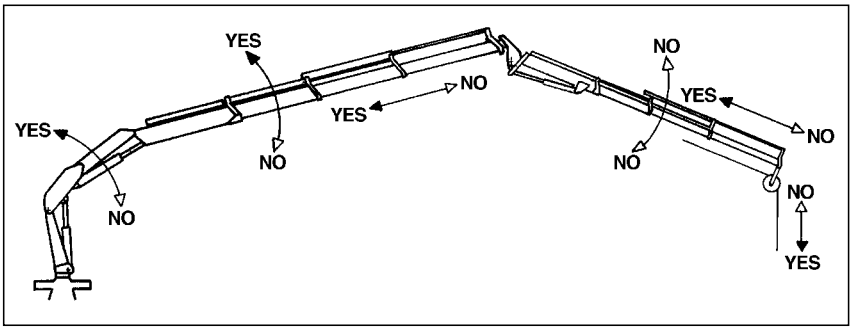


fig. 18a

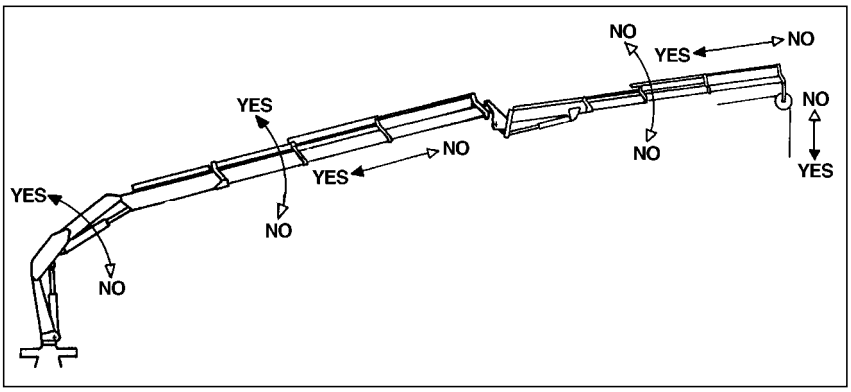


fig. 18b

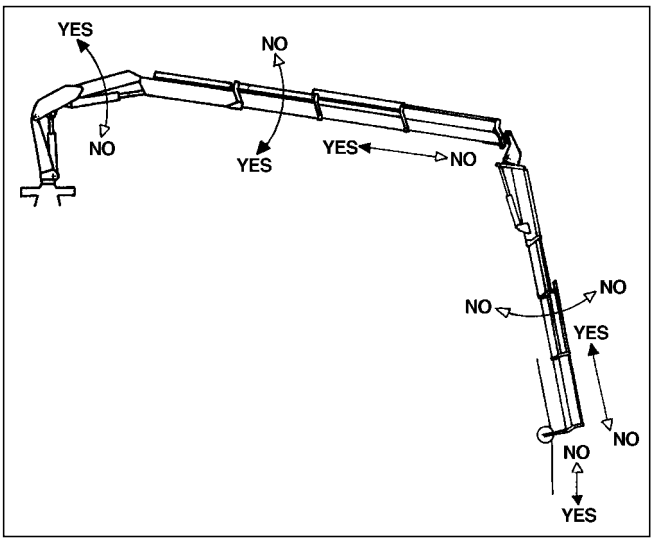


fig. 18c

Lifting moment limiting device

A characteristic which permits the classification of cranes is their lifting capacity or maximum lifting moment. The moment is defined by the value obtained from the weight of the load to be lifted (**kg**) by its distance (**meters**) from the centerline of the crane rotation.

The device called “lifting moment limiting device” preserves the crane structure from overloads, as it prevents any movement which increases the value of the moment up to the maximum established value.

H1.1 Lifting moment limiting device “INTELLIGENT TYPE”

This device utilises an electrohydraulic technology, preventing any movement which causes an increase in the pressure induced by the load in the inner and outer rams of the crane (and of the hydraulic extension if fitted), up to the “critical values”. These values, which are non-exceedable, determine the intervention levels and provide the data for setting the device.

The lifting moment limiting device concernes the following manoeuvres:

- Inner boom descent; the inner boom lift is controlled by the general main pressure valve of the distributor.
- Outer boom lift and descent.
- Extension of extension boom sections.
- Winch rope lift (if fitted).
- If hydraulic extension is fitted: extension outer boom lift and descent.
- Extension of the jib extension booms section.

The lifting moment limiting device system uses the specific functions of the distributor by utilising an electro-hydraulic technology, it does not allow you exceed the set value, by disactivating the controls (levers in neutral position) commanded by the limiting device.

The condition of intervention is operated by the position of the outer boom (or, if hydraulic extension is fitted, the position of the extension outer boom), on which the electronic signal position (mercury level switch) is read by a special electrovalve. This determines controls which are locking or unlocking (resetting) of the controls concerned.

When the moment is reduced, it resets automatically (the manoeuvres blocked by the device are released). **N.B.**: There is a delay of **four (4)** seconds after the moment reduction before the reset can occur in order to safeguard the stability of the device.

Fig. 18a-b-c illustrate the configurations of the crane (and of the eventual hydraulic extension) with the manoeuvres allowed and not allowed by the device, in connection with the horizontal position of the crane and extension outer booms.

(!) CAUTION DANGER (!)

On the outer boom there is a mercury capsule (mercury level switch) duly protected and provided with the following warning stickers.

Mercury is extremely toxic. In case of replacement and/or scrapping, dispose of or recycle the capsule containing mercury with maximum care, and in accordance with the national regulations in force.

H1.2 Lifting moment limiting device for two working sectors (optional)

In case of one sector of the working area with reduced stability of the vehicle (e.g. sector in front of vehicle cab) the limiting device can be provided with a special function which allows to operate with a reduction of the intervention level.
The reduction of the intervention level reduces the crane capacity values and this reduction value is defined in the vehicle stability calculation.
Consequently the working area is divided in one sector (e.g. body side) where the crane works according to the capacity plate values and another sector (e.g. cab side) where it works with reduced capacity values. The device has consequently two intervention levels which are activated in relation to the sector of the crane working area always securing the vehicle stability.

(!) ATTENTION (!)

If the rotation stops by going through the working zone where the crane can operate according to the capacity plate values to the one where it can operate according to the reduced values, it means that one of the following conditions is reached:

- manoeuvre of a load bigger than the one admitted in the reduced sector defined in the vehicle stability calculation
- manoeuvre without load with (at least) one of the inner, outer rams of the crane or the jib (if fitted) extended till the stroke end.

The only manoeuvre allowed is the crane rotation in the reversed sense, and consequently, an action which respectively allows to reduce the moment or to re-enter the inner ram(s), the crane outer ram, the jib outer ram (if fitted).

H1.3 Rotation limiting device

When a sector of the working area exists in which the stability is insufficient (for example in the area in front of the cab) the permitted arc of rotation is limited by means of an adjustable electro-hydraulic device which only allows operation within the safe area. (Warning: persist in the operation!)
When exceeding the “safe area” the rotation limiting device only allows manoeuvres which reverse the direction of rotation.
If a reduction of capacity is necessary because of insufficient stability of the complete unit, new capacity plates must be fixed giving the derated capacity in accordance with the final stability test.

DE1679

DE1680

(!) ATTENTION (!)
Always check carefully that the vehicle is perfectly stable, paying special attention to the area immediately in front of the driver’s cabin as this is usually less stable.

(!) ATTENTION (!)
Do not walk on the lever guards of the lifting moment limiting device positioned on the distributors or electric control panels. DE1679

Do not use water to estinguish fire! DE1680

H1.3 Control panels

The electric control panels are placed next to each control station.

Layout of the control panel (fig. 19)**, placed next to the distributor of the crane**

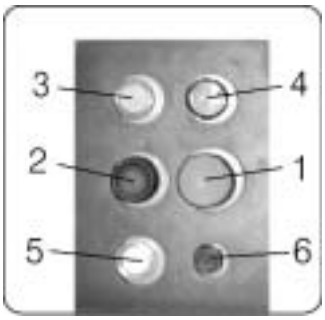


fig. 19

pos. 1 - Stop button (STOP)
2 - Audible alarm push button (danger)
3 - Orange warning light (90% of the capacity has been reached)
4 - Red warning light (activation of the limiting device)
5 - White warning light (power on)
6 - Fuse

Layout of the control panel (fig. 20) **placed on the double control side and on top seat** (version with hand-cable controls)

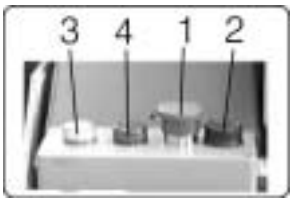


fig. 20

pos. 1 - Stop button (STOP)
2 - Audible alarm push button (danger)
3 - Orange warning light (90% of the capacity has been reached)
4 - Red warning light (activation of the limiting device)

If the **white warning light 5** comes on, it confirms that the electric circuit is active.

!NOTE! In the absence of electric power all crane functions will be desactivated.

If the **orange warning light 3** comes on during load handling, 90% of the capacity (lifting moment) has been reached.

If during operation the **red warning light 4** comes on, the activation value of the lifting moment limiting device has been reached.

Any hidden danger situation for persons must be audibly alarmed by pressing the push button **2**.

When there are serious, imminent and dangerous conditions for persons and things during load handling, operate on the stop button **1**, which isolates all crane functions.

H1.5 EMERGENCY tap lever of the lifting moment limiting device

Firstly remove the protection guard. Then unscrew the fixing screws (13 mm hexagonal spanner).

Each device is fitted with an emergency tap lever (fig. 24) to be used in the event of a black-out, electrical or hydraulic malfunctions or whenever the lifting moment limiting device makes it impossible to use any controls when handling a load (this may occur when the extension booms are fully folded and the load is particularly heavy and bulky).
Only In these situations it is permitted to remove the lead seal placed on the tap lever and place it in the closed position.

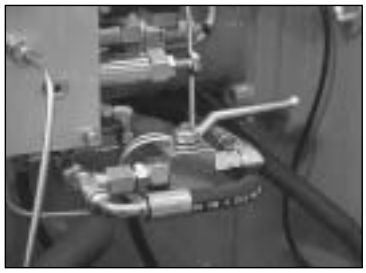


fig. 24

(!) ATTENTION (!)
Activation of the exclusion device or of the emergency tap lever.

When the operator uses this device, it means that he wishes to override the lifting moment lifting device in order to make some manoeuvres (which would be impossible with the device active) that bring the moment to within the maximum level, but involve an overload condition. In such an emergency condition (where the lifting moment limiting device has been disabled), the operator, who is the main responsible for the machine safety, must:

- **carefully consider the manoeuvres required to return to normal working conditions;**
- **calmly and carefully assess the type and scale of the hazards arising from these manoeuvres and the possible reaction of the crane (tipping over, frame overload, uncontrolled fall of the load due to a hydraulic system overload etc.);**
- **make all movements as slowly as possible to reduce the dynamic overload to the minimum.**

After such emergency operations and prior to re-use of the crane, you must immediately go to **FASSI authorised Center** for testing the structure and re-sealing of the device.

(!) Interferences with the valves or removal of the lead seal release the FASSI GRU IDRAULICHE from any responsibility and invalidate the warranty.

(!) ATTENTION (!)
The presence of the lifting moment limiting device does not release the user from the obligation to respect what is indicated on capacity plates and lifting curves.

H2 MANOEUVRES OF THE CRANE LOADS

(!) Before manoeuvering the load, verify that the working area is suitable for your crane.

The lifting curves of the capacity plate indicate the maximum load that the crane can lift at a certain radius and at a certain height.
To utilize the maximum capacity of the crane, it is necessary to position the inner boom as indicated on the capacity plate.

Lifting moment limiting device
A characteristic which permits the classification of cranes is their lifting capacity or maximum lifting moment. The moment is defined by the value obtained from the weight of the load to be lifted (**kg**) by its distance (**meters**) from the centerline of the crane rotation.
The device called “lifting moment limiting device” preserves the crane structure from overloads, as it prevents any movement which increases the value of the moment up to the maximum established value.

H2.1 Lifting moment limiting device “INTELLIGENT TYPE” (optional)

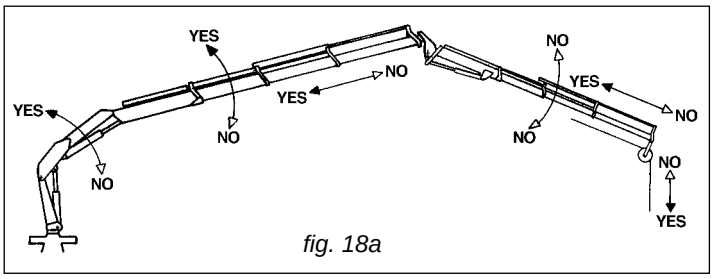


fig. 18a

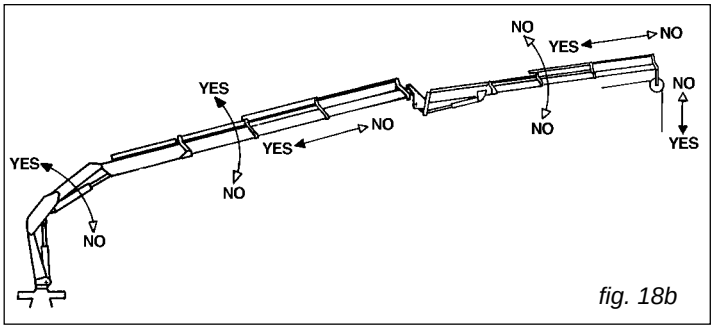


fig. 18b

This device utilises an electrohydraulic technology, preventing any movement which causes an increase in the pressure induced by the load in the inner and outer rams of the crane (and of the hydraulic extension if fitted), up to the “critical values”. These values, which are non-exceedable, determine the intervention levels and provide the data for setting the device.

The lifting moment limiting device concernes the following manoeuvres:
- Inner boom descent; the inner boom lift is controlled by the general main pressure valve of the distributor.
- Outer boom lift and descent.
- Extension of extension boom sections.
- Winch rope lift (if fitted).
- If hydraulic extension is fitted: extension outer boom lift and descent.
- Extension of the jib extension booms section.

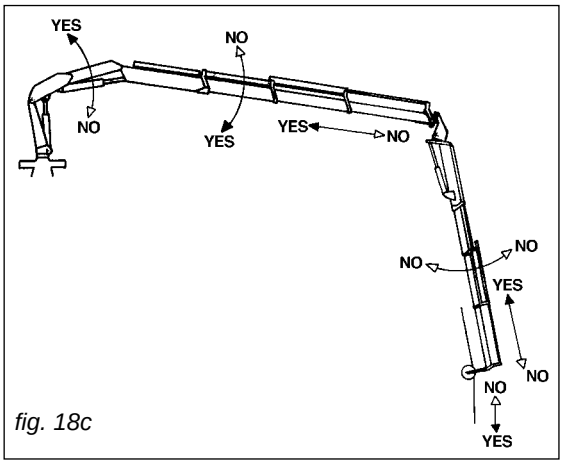


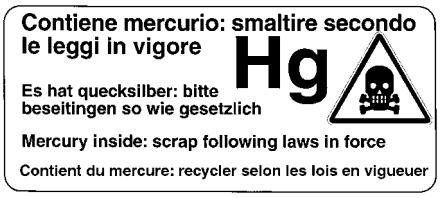
fig. 18c

The lifting moment limiting device system uses the specific functions of the distributor by utilising an electro-hydraulic technology, it does not allow you exceed the set value, by disactivating the controls (levers in neutral position) commanded by the limiting device. The condition of intervention is operated by the position of the outer boom (or, if hydraulic extension is fitted, the position of the extension outer boom), on which the electronic signal position (mercury level switch) is read by a special electrovalve. This determines controls which are locking or unlocking (resetting) of the controls concerned. When the moment is reduced, it resets automatically (the manoeuvres blocked by the device are released). **N.B.**: There is a delay of **four (4)** seconds after the moment reduction before the reset can occur in order to safeguard the stability of the device.

Fig. 18a-b-c illustrate the configurations of the crane (and of the eventual hydraulic extension) with the manoeuvres allowed and not allowed by the device, in connection with the horizontal position of the crane and extension outer booms.

(!) CAUTION DANGER (!)

On the outer boom there is a mercury capsule (mercury level switch) duly protected and provided with the following warning stickers.



Mercury is extremely toxic. In case of replacement and/or scrapping, dispose of or recycle the capsule containing mercury with maximum care, and in accordance with the national regulations in force.

H2.2 EMERGENCY tap lever of the lifting moment limiting device

Firstly remove the protection guard. Then unscrew the fixing screws (13 mm hexagonal spanner). Fig. 24

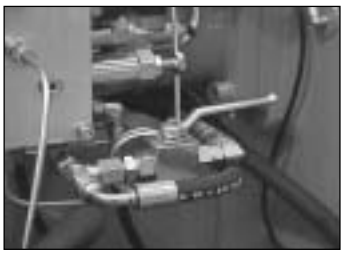


fig. 24

Each device is fitted with an emergency tap lever (fig. 24) to be used in the event of a black-out, electrical or hydraulic malfunctions or whenever the lifting moment limiting device makes it impossible to use any controls when handling a load (this may occur when the extension booms are fully folded and the load is particularly heavy and bulky).
Only In these situations it is permitted to remove the lead seal placed on the tap lever and place it in the closed position.

(!) ATTENTION (!)

Activation of the exclusion device or of the emergency tap lever.

When the operator uses this device, it means that he wishes to override the lifting moment lifting device in order to make some manoeuvres (which would be impossible with the device active) that bring the moment to within the maximum level, but involve an overload condition. In such an emergency condition (where the lifting moment limiting device has been disabled), the operator, who is the main responsible for the machine safety, must:

- **carefully consider the manoeuvres required to return to normal working conditions;**
- **calmly and carefully assess the type and scale of the hazards arising from these manoeuvres and the possible reaction of the crane (tipping over, frame overload, uncontrolled fall of the load due to a hydraulic system overload etc.);**
- **make all movements as slowly as possible to reduce the dynamic overload to the minimum.**

After such emergency operations and prior to re-use of the crane, you must immediately go to **FASSI authorised Center** for testing the structure and re-sealing of the device.

(!) Interferences with the valves or removal of the lead seal release the FASSI GRU IDRAULICHE from any responsibility and invalidate the warranty.

(!) ATTENTION (!)

The presence of the lifting moment limiting device does not release the user from the obligation to respect what is indicated on capacity plates and lifting curves.

(!) ATTENTION (!)

Always check carefully that the vehicle is perfectly stable, paying special attention to the area immediately in front of the driver's cabin is usually less stable.

(!) ATTENTION (!)

Do not walk on the lever guards of the lifting moment limiting device positioned on the distributors or electric control panels. DE1679

DE1679

Do not use water to estinguish fire! DE1680

DE1680

L0 USE OF IMPLEMENTS

The crane, in load condition H1B3, can be provided with implements such as:

- Manual extensions
- Winches
- Hydraulic extensions
- Personnel baskets
- Clam ‘shell buckets
- Augers
- Radio remote control.

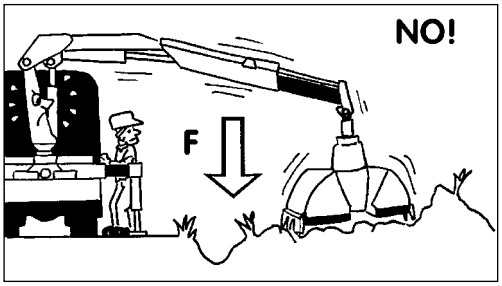
(!) When using an implement it is always necessary to check that its weight, dimension and capacity is matched to the crane performances.
For further information please refer to **FASSI GRU IDRAULICHE**

Warning and norms for crane use also apply for hydraulic implement use.

Before using a personnel basket it is necessary to provide the crane with the safety devices requested by the local norms in force and prior to use of the crane it has to be tested and inspected in accordance with the local legal requirements.

(!) In case of implements on the load or the truck body it is necessary to check they are locked to assure the impossibility of accidental movements.

(!) The crane can operate, intermittently and not continuously, with lifting devices other than the hook, only on loose and light materials (not on scrap iron).
The dimensions and the capacity of the implements must be proportioned with crane performances.



(!) WARNING (!)
CRUSHING OR PUSH MANOEUVRES ARE NOT PERMITTED.

L0.1 Hydraulic connections for implements - supplementary hoses.

(!) WARNING (!)
To ensure that the control corresponds to the implement movement, hydraulic connections are symmetrically fitted with coupling unions. Never invert such positions: movements inversion as well as operating difficulties or unusual overload with implement itself could occur.

NOTE
When using coupling unions it is necessary to verify that there is no trace of soil, curt etc. on the unions and inside the seats so as to avoid the oil contamination and consequently wear the tightening “ surface of unions or ram seals.

L1 MANUAL EXTENSIONS

These are additional extensions, which are placed in the hydraulic extensions of the crane and of the hydraulic jib and secured by locking pins.
Manual extensions have a maximum capacity independent from the crane configuration as shown on the capacity plates.

(!) WARNING (!)
Manual extensions are not protected by the lifting moment limiting device.

Before lifting the load make sure that its weight does not exceed the capacity indicated on the capacity plate.
Manual extensions can be extracted from the rest position and be operative, once the security pins have been removed, with the outer boom in sliding position.

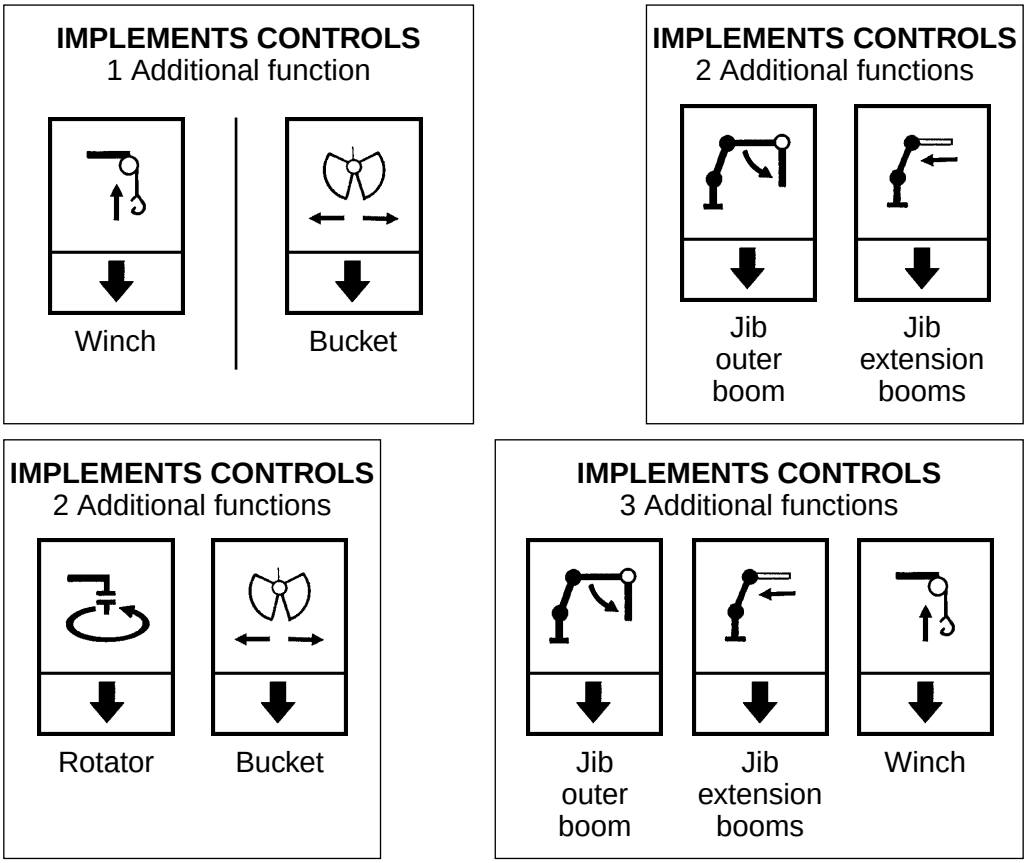
Verify that the area is suitable for this operation and there are no unauthorized persons in the working area.

Do not permit the extension to slide out at speed as this will damage the stroke end stops.

Do not try to align the holes (slots) for the locking pins with your fingers; always use a suitable tool.
When manual extensions are in place, fit the locking pins and secure them with the check pins to prevent accidental escape.

(!) Always remember that when operating with implements, their tare weight must be deducted from the capacity of the crane.

L2 CONTROLS TO OPERATE THE HYDRAULIC IMPLEMENTS OF THE CRANE



The plates placed over each lever define their function in relation to their movement.

(!) ATTENTION (!)
The sequence of the plates placed on the crane controls may be different.

Make sure that the lever you are going to operate correspond to the control you selected.

L3 WINCH

The winch is made of a drum that can rotate by means of a hydraulic motor, on a structure fixed on the crane. The rotation of the drum on which the cable winds is achieved by a hydraulic motor controlled by a safety check valve connected to the crane circuit. A parking brake integrated to the motoreducer group hold the load in position when the winch control lever is in neutral position.

Nomenclature of winch unit (fig. 25)

Pos. Description
1. Winch
2. Cable
3. Fixed pulley
4. Balance weight
5. Hook
6. Transmission pulley
7. Block (double-triple.... line)

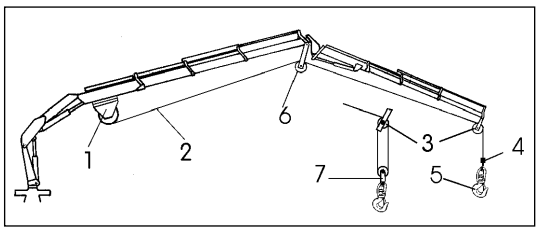


fig. 25

(!) WARNING (!)

Check the condition of wire rope.
Do not rotate the crane before the load is lifted. Lift the load vertically using the cable and not the boom in order to avoid swinging the load. With the suspended load rotate slowly and with care checking the stability of the vehicle.

L3.1 CE Winch for crane

The identification data and the essential characteristics are marked on a plate fixed by the manufacturer and used for the CE mark (fig. 26) which testifies its conformity to the Machine Directive (D.M.)

Manufacturer mark ...
Winch type ...
Serial number ...
Maximum line in N at the 4th layer...
Maximum speed in m/min ...

fig. 26

(!) See operator winch manual supplied by the winches' manufacturer.

The winch has a maximum capacity, indicated by a plate, not related to the crane capacities which can also be lower.

Consequently avoid to lift, with the winch, heavier loads than those allowed by the crane capacity plate.

The couple limiter, installed on the winch structure, prevents that on the cable, can be created a load major to the value of maximum line at the 4th layer, quiescing all the crane controls.

(!) Under no circumstances interfere with the limiter device adjustment.

Winches are equipped with an end stroke device that in the lifting or in the booms extension rams exit prevents the cable hook or the block from hitting the fixed pulley, and in the unwinding keeps at least three **(3)** turns of the cable wound around the winch drum, tripping either device disactivates the relevant controls.

To reactivate the controls the winch control lever must be activated controlling:
- the descent if the device operation is happened in the lifting or in exit with the booms extension rams;
- the lifting if the operation is happened in the unwinding of the same one.

It is recommended to avoid working with the cable hook or the block too close to the pulley structure; the activation of the device could provoque dangerous swinging.

The pulley structure is provided with a group with microswitch (fig. 27) whose lever is kept in position by a balance weight (sliding on the cable); the cable hook or the block lift the balance weight thus releasing the lever becomes impossible with the consequent disactivation of the controls. Please note that each movement of the crane resulting in the exclusion of the balance weight action, engenders the disactivation of the controls.

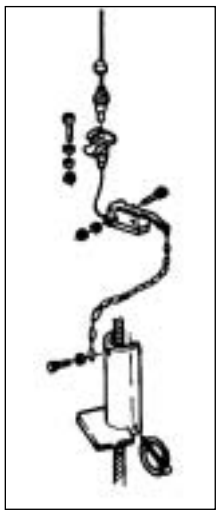


fig. 27

Folding the crane in rest position

- withdraw the flying drive (it is assembled on the cable of the cable winder) from the pin placed near the microswitch, placed on the pulley, assembled on the booms extension rams.
- Release the cable from all support rings placed on the booms letting that it winds free in the cable winder.
- Insert the flying drive in the pin placed in the cable winder; this operation gets active all crane controls to complete the rest position operations.
- Withdraw the cable from the pulleys, then remove them from the crane (reposition the pins and the security pins)
- Operate the ascent of the winch in order to wind the cable on winch drum, always keeping the cable in tension; with the cable layer easing the regular rewinding and without overlaps.
- Hook the thimble to a support apt to keep the cable sufficiently taut.

NOTE

On cranes fitted with hydraulic extension, in some cases the winch is mounted on a rotating support to reduce the overall dimensions; to put the winch to the rest position, operate as following:

- to position the outer boom vertically.
- to withdraw the security pin, the screw nut and the locking pin from the supports. The pin should be withdraw easily and without putting up resistance; if so the winch support is not enough vertical with consequent dangerous rotation of the group when the pin is finally removed. Then position the crane outer boom in vertical position, and try to withdraw the security pin once again.
- Rotate the winch support until it reaches its new position,
- Insert the locking pin, the screw nut and the security pin.

To put the crane in working position it is necessary to carry out the operations in reverse.

Rotate the winch support with extreme care in order not to damage the hoses and electric components.

To fold the crane in rest position see Paragraph H0.2

(!) ATTENTION (!)

Please remember that after placing the crane in working position it is compulsory to reset the functionality of end stroke device, otherwise the cable could be damaged.

L3.2 Winch for crane

(!) ATTENTION (!)

It is necessary to avoid, on pain of damaging the cable, that:

- **in the lifting with the winch or in the booms extension rams exit the cable hook (or the block) takes contact with the fixed pulley;**
- **in the unwinding the cable is completely wound from the winch drum; three -3- turns must be wound at least, causing the controls quiescing.**

(!) On winches not equipped with cable layer, check the rewinding of the cable on winch drum proceeds regularly and without overlapping: it is suggested to rewind the cable only if it is sufficiently taut.

L4 HYDRAULIC JIBS

The hydraulic jibs, foldable behind the cab, are additional booms, with articulation and with one or more extension booms to be fitted to the last extension boom of the crane; on request the manual extensions can be installed on the extension booms of the jib.

Hydraulic jibs							
Extension type	Weight=kg	Manual	Weight=kg	Manual	Weight=kg	Manual	Weight=kg
L102	320	ML10	20	----------		----------	
L313	690	NL31	48	PL31	32	QL31	22
L314	800	----------		PL31	32	QL31	22
L403	730	NL40	58	PL40	32	QL40	22
L404	850	----------		PL40	32	QL40	22
L604	1200	PL60	54	QL60	39	RL60	31

NOTE
The weights reported in the table are indicative and can vary in relation to the fittings.

The jibs are fitted by means of the insertion of the extension connecting boom into the crane extension boom; the fixing to the crane is obtained through locking pins. The hydraulic connection to the supplementary functions of the crane, is through quick couplings.

(!) Warnings and norms for crane utilisation apply also for hydraulic jibs use.

(!) Warnings and norms for manual extensions are indicated at Paragraph L1.

(!) ATTENTION (!)
It is recommended to employ lifting means adequate to the weight of the load and radius of the extensions; during this operation the operator is responsible for the machine safety.
The slings or the cables used for handling the load should have the adequate capacity and length; try to avoid the load overturning by having one length passed through itself and the other one through the hook.

L4.1 Identification of the hydraulic jib

The model, the version of the crane, the year of construction and the serial number are stamped on the hydraulic jib (fig. 28) in the following sequence:

L102*03*001
A B C

A = model
B = year of construction
C = serial number

L4.2 Nomenclature of the hydraulic jib

Pos. Description

1. Connecting boom
2. Locking pins
3. Jib outer ram
4. Jib outer boom
5. Boom extension rams
6. Extension booms
7. Manual extension (on request)
8. Lifting hook

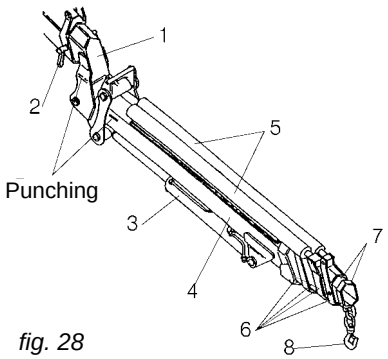


fig. 28

L4.3 Manoeuvres to unfold the jib in working condition

Operate as described to put the crane in working condition (paragraph H0.1).

By operating the corresponding levers:
- open the outer boom of the jib;
- extend the jib outer boom sliding sections;
- position the hook on the centerline of the load.

L4.4 Manoeuvres to fold the jib in rest condition

By operating the corresponding levers:
- re-enter the hydraulic sections of the jib and of the crane;
- lift the inner boom to its stroke end;
- re-enter the outer boom of the jib and of the crane to its stroke end;
- operate, as described, to fold the crane in rest position.

(!) WARNING (!)
Always check and record the overall height of the crane in the folded position or in laid position in the body or on the load.
Always respect and pay proper attention that the load and dimension limits are in conformity with the road regulations.

L4.5 Operations to remove the hydraulic jib from the crane

By operating the corresponding levers:
- re-enter the jib outer booms sliding sections to their stroke end;
- extend the crane outer ram to its stroke end;
- extend (of at least 1 - 1,5 m) the crane outer booms sliding sections;
- re-enter the outer ram of the jib and the inner ram of the crane to obtain the two rest brackets of the jib, either lay on the ground, or on the truck body or, if possible, on a specific rest trestle;
- remove screwing the locking pins;
- re-enter the outer booms sliding sections of the crane to free the first boom of the crane jib;
- disconnect the jib from the hydraulic circuit of the crane operating on the quick couplings.

(!) Assure that the hydraulic jib is adequately stripped to avoid side turnover.

L4.6 Operations to mount the hydraulic jib on the crane

By operating the corresponding levers:
- place the extension on the vehicle or on the ground in the direction of the movement of the extension booms;
- extend the crane outer ram to its stroke end and position the extension booms of the crane not too close to the first boom of the jib in order to allow the lining-up manoeuvres and the connection of the hoses;
- connect the jib hoses to the hydraulic plant through coupling unions, following indications of Paragraph L0.1, Hydraulic connections for implements - supplementary hoses;
- operate the outer ram of the jib and the inner ram of the crane in order to align the extension booms of the crane and the first boom of the jib thus allowing their connection;
- eventually repeat the previous operation until the fixing holes are aligned, working on the extension booms of the crane;
- insert the lock pin into the fixing holes and secure it with the check pin.

M0 MAINTENANCE INSTRUCTIONS

To assure a long life to the crane, it is necessary to meticulously follow the maintenance instructions.

General lubrication and small repairs can be carried out by the user; repairs of a more complicated nature must be carried out by authorized service personnel.

Spare parts must be original.

Good maintenance and proper use are imperative to maintain efficient use and guarantee the safety of the crane.

At least once a year you must take the crane to a **Fassi Service Center** for a check.

(!) Before disconnecting any hydraulic hoses, ensure that there is no pressure in the hydraulic circuit.
After removing hoses always mark them and their respective ports on the crane. Faulty replacement can cause damage to the rams and to the hydraulic circuit.

Respect the information supplied for maintenance and technical assistance.

Any maintenance operation must be carried out with the crane power source turned off. (in case of fixed mounting with hydraulic power pack, the electric motor has to be turned off).

Do not place limbs, fingers or any other parts of anatomy into areas of the crane, which present possibilities of shearing, without having blocked such parts of the crane.

Do not weld, drill or grind any part of the crane without the Manufacturer's authorisation.

Do not weld the fixing rods of the crane (see plate DE1574 fig. 29)

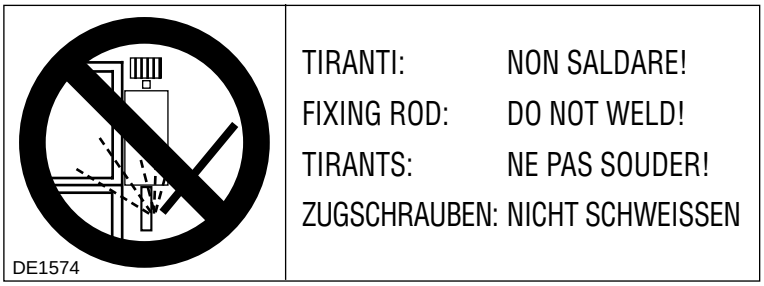


fig. 29

When repairs to, or checks of, the hydraulic circuit and of the rams are carried out, it is very important not to use, or be in the proximity of, materials which can damage the circuit or contaminate the hydraulic oil eg. metal shavings, sand or dust.

Do not use the high pressure washing on the controls (deviators, distributors, double controls, hand cable controls...), on the electronic components (boxes, control panels...), on the tanks.

Never use detergents, petrolsol or inflammable liquids, always use non flammable or non toxic liquids.

To avoid down time, it is recommended to periodically carry out the following checks.

M0.1 At the end of every working day

- Check that all safety devices are efficient.
- Check the level of the hydraulic oil in the tank.
- Check all the components of the hydraulic circuit for possible leaks.
- Check that the control and the oil diverter levers can easily be positioned; they must show no signs of forcing.
- Check the condition of shackles, hooks, wire ropes and any other lifting equipment.

M0.2 After the first 40 hours use

Check the tightening torque of the fixing rods of the crane (fig. 30).

See table at paragraph M0.4

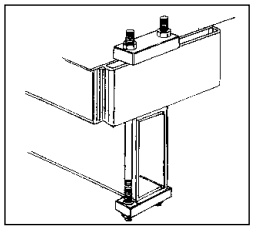


fig. 30

M0.3 After every working week

Clean the oil filter placed in the oil tank of the crane and if any, on the pump section and pressure hoses.

NOTE The filters of fibre or paper can not be cleaned, they must be replaced.

Cleaning of the wire mesh filter on the tank (oil return to the oil-tank) fig. 31.

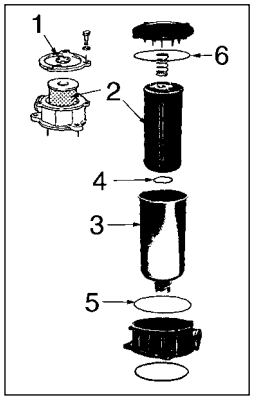


fig. 31

- Unscrew the security bolts of the filter cover 1 and remove it.
- Extract the cartridge, clean by flushing with a non flammable, non corrosive and non toxic solvent (gas oil or other). Thoroughly dry the filter inside and out (do not use compressed air).
- Check if the cartridge has collapsed; if so, replace it!
- Remove the filter body 3 and clean it.
- Re-assemble the filter body and the cartridge: check the sealing of the 'O' ring 4-5-6; in case, replace it!

NOTE
Take care that no contaminated material passes into the tank.

Replacement of the filter on the delivery line (before the distributor) fig. 32.

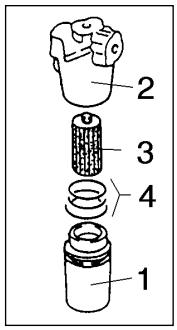


fig. 32

- When the visual indicator becomes red, replace the cartridge.
- Unscrew with a suitable spanner the filter body (**1**) from the head (**2**).
- Remove the cartridge (**3**) and replace it!
- Clean inside the holder.
- Re-assemble checking the seal (**4**) on the filter body.
- Screw the filter body into the head.

Check the oil level in the tank with the crane in the folded position and with the outriggers (crane and supplementary) fully re-entered. The oil level must not exceed the maximum or be lower than the minimum (fig. 33).

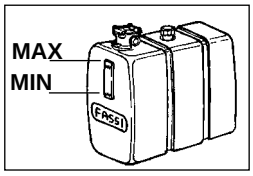


fig. 33

Top up using hydraulic oil with the same characteristics as those indicated in the table at paragraph N0.

All the lubricators mounted on the crane are protected by a plastic cap so to avoid the oil contamination.

Periodically grease the points indicated on the crane (fig. 35) (and on the hydraulic jib, when fitted, fig. 36) paying particular attention to the points not easily detected.

For the sliding sections of the outrigger supports and of the extension booms guide shoes made from a special material have been fitted: to ease their movement it is recommended to smear a light film of grease on them, taking care that the surfaces of the extension booms are free from impurities such as sand etc.

Use a grease with the same characteristics indicated in the table at Paragraph N0.

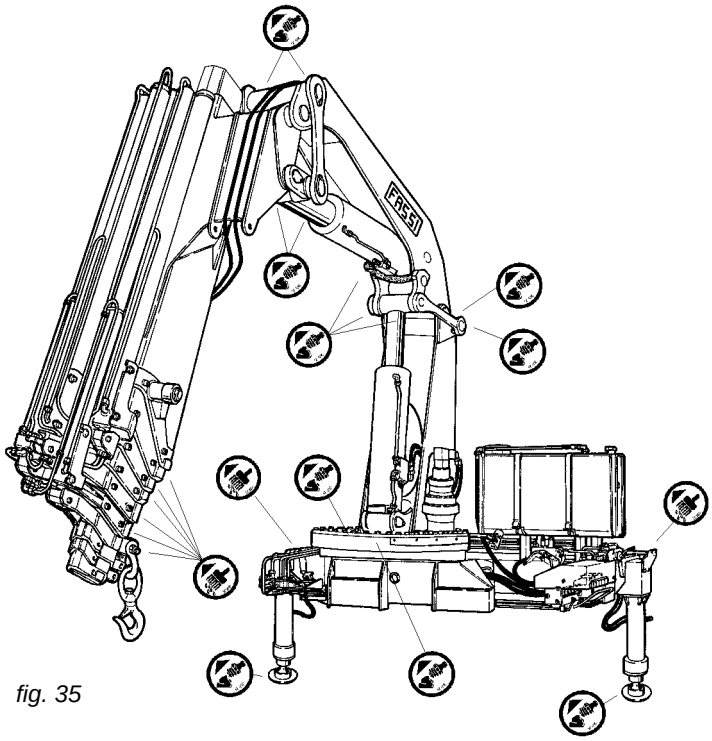


fig. 35

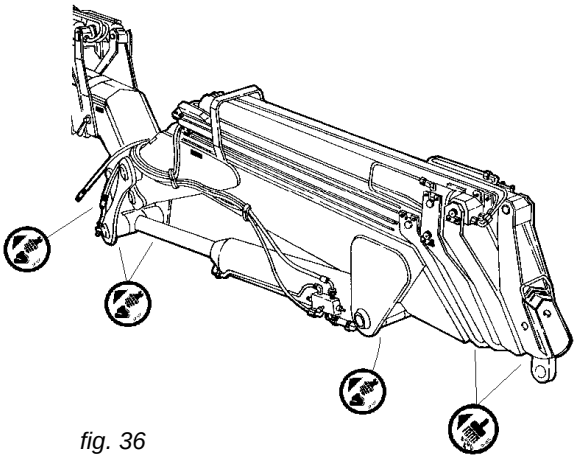


fig. 36

After every 100 working hours or more frequently in case of more intensive utilisation

Grease the slew gear to prevent friction during rotation and to ensure that it is stable by preventing water (corrosion protection) and contaminants from entering the bearings. For a better internal distribution of the grease it is advisable to rotate the crane and grease it in such a way as to see grease at the seals.
Use a grease with the same characteristics indicated in the table at Paragraph N0.

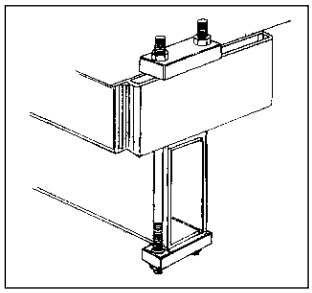
Grease the winch cable (if fitted) after having first cleaned the cable of any encrustation (grease mixed with sand, dust, dirt etc.) The lubricant used must guarantee a good level of penetration in order to lubricate both the inside and the outside of the cable.
Use a grease with the same characteristics indicated in the table at Paragraph N0.

M0.4 After every 500 working hours

Check the tightening torque:
- of the fixing rods of the crane; consult the following table in order to find it's value according to the bolt diameter:

Table of the tightening torques of the fixing rods of the crane on the vehicle From "C0404 Kit for crane fixing".

D. Fixing rods	Tightening torque = Nm
M22x1,5	300
M24x2,0	400
M27x2,0	600
M30x2,0	471
M33x2,0	1200
M39x3,0	1800



- of the slew gear screws (bolts M20 Class 12.9 = 620 Nm)
- of the securing bolts for the ram pins and of all the other bolts and screws, where the tightening torque is not expressly indicated, consult the following table in order to find it's value according to the bolt diameter and class.

Table of the bolts tightening torque with average friction value (0,15) and average-good tightening accuracy (C).

From ... "ELEMENTS DE FIXATION - ASSEMBLAGES VISSES" (AFNOR E 25-030 1984)

Diameter Bolt = D	Class 8.8 Torque = Nm	Class 10.9 Torque = Nm	Class 12.9 Torque = Nm
3	1,06	1,56	1,83
4	2,44	3,58	4,19
5	4,83	7,10	8,30
6	8,30	12,30	14,30
8	20	29	35
10	40	59	69
12	69	102	119
14	111	163	191
16	173	255	298
18	239	352	412
20	339	499	584
22	466	685	802
24	584	858	1004
27	865	1271	1487
30	1173	1723	2016
33	1594	2342	2740
36	2046	3006	3517
39	2658	3905	4570

Check the rotation control motoreducer oil level. Fig. ...

- Remove the bleed plug (**1**) using a 22 mm Allen wrench.
- Remove the plug (**2**) using an 8 mm Allen wrench and the O-ring.
- Top up, if necessary, with the same type of oil as indicated in the table at Paragraph N0 via the mouth (bleed plug).
- The correct level is reached when oil starts to escape from the threaded hole in plug (**2**).
- Check the state of wear of the O-rings (replace if necessary) and then return the plugs.
  The lubrication oil can be drained completely by removing plug (**3**) using an 8 mm Allen wrench.

Check the guide shoe wear as it affects the sliding section tolerances; if the clearances are considerable, damage to the rams and the structure may occur.

Clean the air filter placed in the top of the oil tank filter cap.

Completely replace the hydraulic oil and the filter cartridges.

(!) The waste oil and the filter cartridges MUST be disposed of by authorized persons.

(!) CAUTION DANGER (!)

On the outer boom there is a mercury capsule (mercury level switch) duly protected and provided with the following warning stickers.

MERCURY IS EXTREMELY TOXIC. IN CASE OF REPLACEMENT AND/OR SCRAPPING, DISPOSE OF OR RECYCLE THE CAPSULE CONTAINING MERCURY WITH MAXIMUM CARE, AND IN ACCORDANCE WITH THE NATIONAL REGULATIONS IN FORCE.

M0.5 Complete overhaul of the crane

When one of the limits indicated hereunder is reached, **a complete overhaul with in-depth structural inspection** of the crane must be carried out by the Manufacturer or by an authorised service centre.

10.000 working hours
(i.e.: 10 years, 50 weeks a year, 20 hours a week, or 5 years, 50 weeks a year, 40 hours a week)

10 years' life of the crane

N0 TABLE OF HYDRAULIC OIL AND LUBRICANTS CHARACTERISTICS

HYDRAULIC OIL WITH HIGH VISCOSITY: ISO-L-HV		
Minimal external temperature:	maximal oil temperature:	Gradation
-35°C	+45°C	ISO VG 32
-20°C	+75°C	ISO VG 46

HYDRAULIC OIL WEAR RESISTANT: ISO-L-HM		
Minimal external temperature:	maximal oil temperature:	Gradation
-10°C	+60°C	ISO VG 32
+ 0°C	+75°C	ISO VG 46
+ 5°C	+85°C	ISO VG 68
+10°C	+90°C	ISO VG 100

GREASE
Consistency: NLGI BEACON EP 2 - BEACON 3

GREASE (for slew ring)
-30°C up to +130°C EP2 Gradation All grease used must be free from acid and resin, not hydroscopic and long-life such as BP GREASE LTX-EP2 or ELF EPEXA 2 or ESSO BEACON EP2 or SIMILARI.

HYDRAULIC OIL FOR MOTOREDUCER
Classification ISO-L-CC Gradation EP ISO-VG 150

LUBRICATING OIL (for winch cable)
The most suitable here is a general-purpose lubricating oil with about SAE 30° viscosity. A lubricating oil containing non-stick additives is recommended if the cables are expected to move quickly through the pulleys. BRILUBE 50 (BRITISH ROPES - BRINDON)

(!) WARNING (!)
Don’t use greases with solid particles as “Bisulphide of Molybdenum”.

P0 POSSIBLE FAULTS

Many years experience of our product has allowed us to identify and classify the most common faults which occur. In most cases it requires accurate hydraulic and electric troubleshooting and simple rectification. In the following table we report the most frequent inconveniences and our suggested remedies.

(!) Checking and adjustment of oil pressures of valve settings must be carried out by an authorized service agent, under penalty of warranty forfeiture.

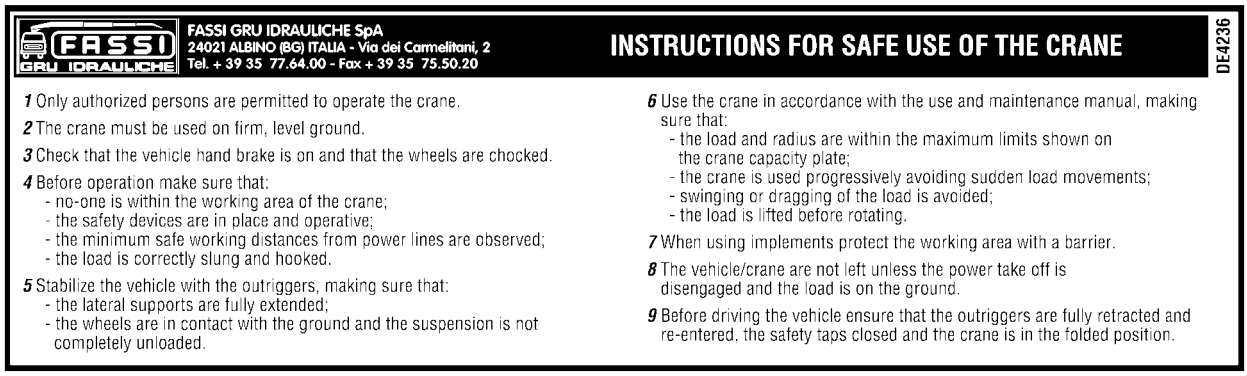
P0.1 Operations which can be carried out by the user

FAULTS	CAUSE	REMEDIES
The crane does not rotate properly	Vehicle non in level position Lack of lubrication	Stabilize the vehicle Grease the slew ring and the pinion gear-slew ring group
The extension booms do not completely extend or work jerkily	Lack of lubrication of the guide shoes	Grease the guide shoes
Crane controls are not active	Lack of electric energy Winch end stroke active The rotation limiting device is activated	Check the fuse, the battery and electric circuit See L3.1 See H1.7
Vibrations in crane operations	Shortage of oil Obstructed filters	Check the level and top up if necessary Clean or replace the filter cartridge
Noteable decrease in movement speed	Obstructed filters	Clean or replace the filter cartridge

P0.2 Operations to be carried out by an authorized service center.

FAULTS	CAUSE	REMEDIES
The crane does not lift the loads indicated on the capacity plate	Non efficiency of the pump	Replace the pump
	(main pressure or auxiliary) valves not properly adjusted, or worn	Check the pressure, adjust the valves or replace them!
	Ram seals are not properly fitted	Replace the seals
A boom of the crane does not hold up the load and visually lowers	The safety check valve the ram is open	Replace the valve
	Oil leaks inside the ram	Defective seals, replace them!
The crane does not rotate properly	Valve controlling the rotation not adjusted	Adjust the valve
	Wear of the slew ring	Check the slew ring wear, replace if necessary
	Wear of the motoreducer group	Check the motore-ducer group wear, replace if necessary
The extension booms do not completely extend or work jerkily	Wear of guide shoes	Check the guide shoes wear, replace if necessary
Vibrations in crane operations	Non efficient pump	Check the pump
Noteable decrease in movement speed	Non efficient pump	Check the pump

R0 INSTRUCTION AND WARNING PLATES



FASSI GRU IDRAULICHE SpA
24021 ALBINO (BG) ITALIA - Via dei Carmelitani, 2
Tel. + 39 35 77.64.00 - Fax + 39 35 75.50.20

INSTRUCTIONS FOR SAFE USE OF THE CRANE

DE4236

1 Only authorized persons are permitted to operate the crane.

2 The crane must be used on firm, level ground.

3 Check that the vehicle hand brake is on and that the wheels are chocked.

4 Before operation make sure that:
- no-one is within the working area of the crane;
- the safety devices are in place and operative;
- the minimum safe working distances from power lines are observed;
- the load is correctly slung and hooked.

5 Stabilize the vehicle with the outriggers, making sure that:
- the lateral supports are fully extended;
- the wheels are in contact with the ground and the suspension is not completely unloaded.

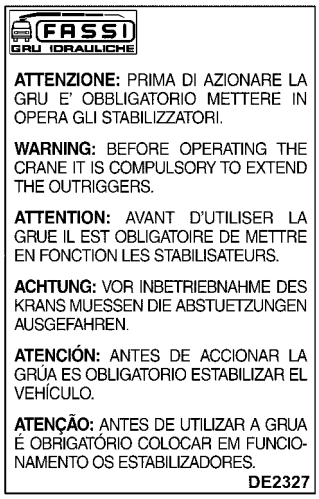
6 Use the crane in accordance with the use and maintenance manual, making sure that:
- the load and radius are within the maximum limits shown on the crane capacity plate;
- the crane is used progressively avoiding sudden load movements;
- swinging or dragging of the load is avoided;
- the load is lifted before rotating.

7 When using implements protect the working area with a barrier.

8 The vehicle/crane are not left unless the power take off is disengaged and the load is on the ground.

9 Before driving the vehicle ensure that the outriggers are fully retracted and re-entered, the safety taps closed and the crane is in the folded position.

DE 4236
Instruction plate and safety norms



FASSI GRU IDRAULICHE

ATTENZIONE: PRIMA DI AZIONARE LA GRU E' OBBLIGATORIO METTERE IN OPERA GLI STABILIZZATORI.

WARNING: BEFORE OPERATING THE CRANE IT IS COMPULSORY TO EXTEND THE OUTRIGGERS.

ATTENTION: AVANT D'UTILISER LA GRUE IL EST OBLIGATOIRE DE METTRE EN FONCTION LES STABILISATEURS.

ACHTUNG: VOR INBETRIEBNAHME DES KRANS MUESSEN DIE ABSTUETZUNGEN AUSGEFAHREN.

ATENCIÓN: ANTES DE ACCIONAR LA GRÚA ES OBLIGATORIO ESTABILIZAR EL VEHÍCULO.

ATENÇÃO: ANTES DE UTILIZAR A GRUA É OBRIGATÓRIO COLOCAR EM FUNCIONAMENTO OS ESTABILIZADORES.

DE2327

DE 2327
Warning plate to stabilize the vehicle before using the crane

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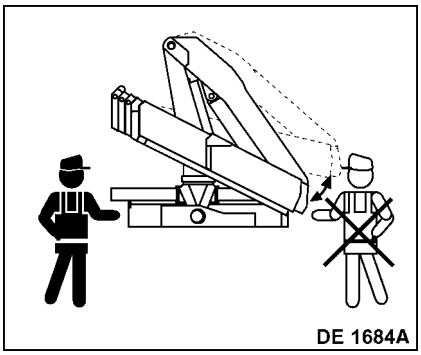

DE 1684A

DE 1684A
Do not operate from the double control side, to unfold or fold the crane

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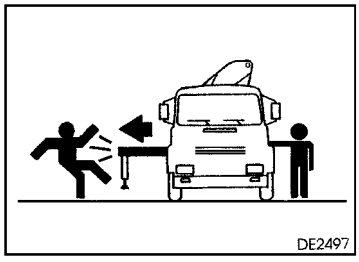
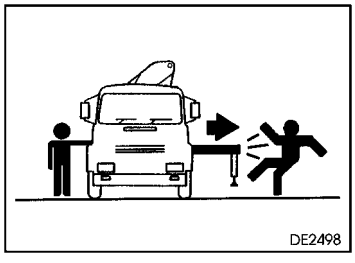


DE2497

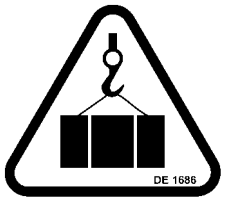
DE 2497



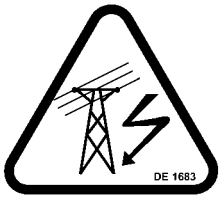
DE2498

DE 2498

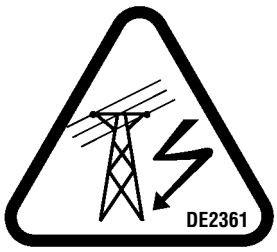
Warning plates to make sure that no one is or transits in close proximity of the outriggers



DE 1686
Do not walk or stop under a suspended load



DE 1683
Do not operate in proximity of electric high-tension lines



DE 2361
Do not operate in proximity of electric high-tension lines

DE 1681
Greasing points with brush

DE 1682
Greasing points at pressure

DE 1679
Do not walk on...

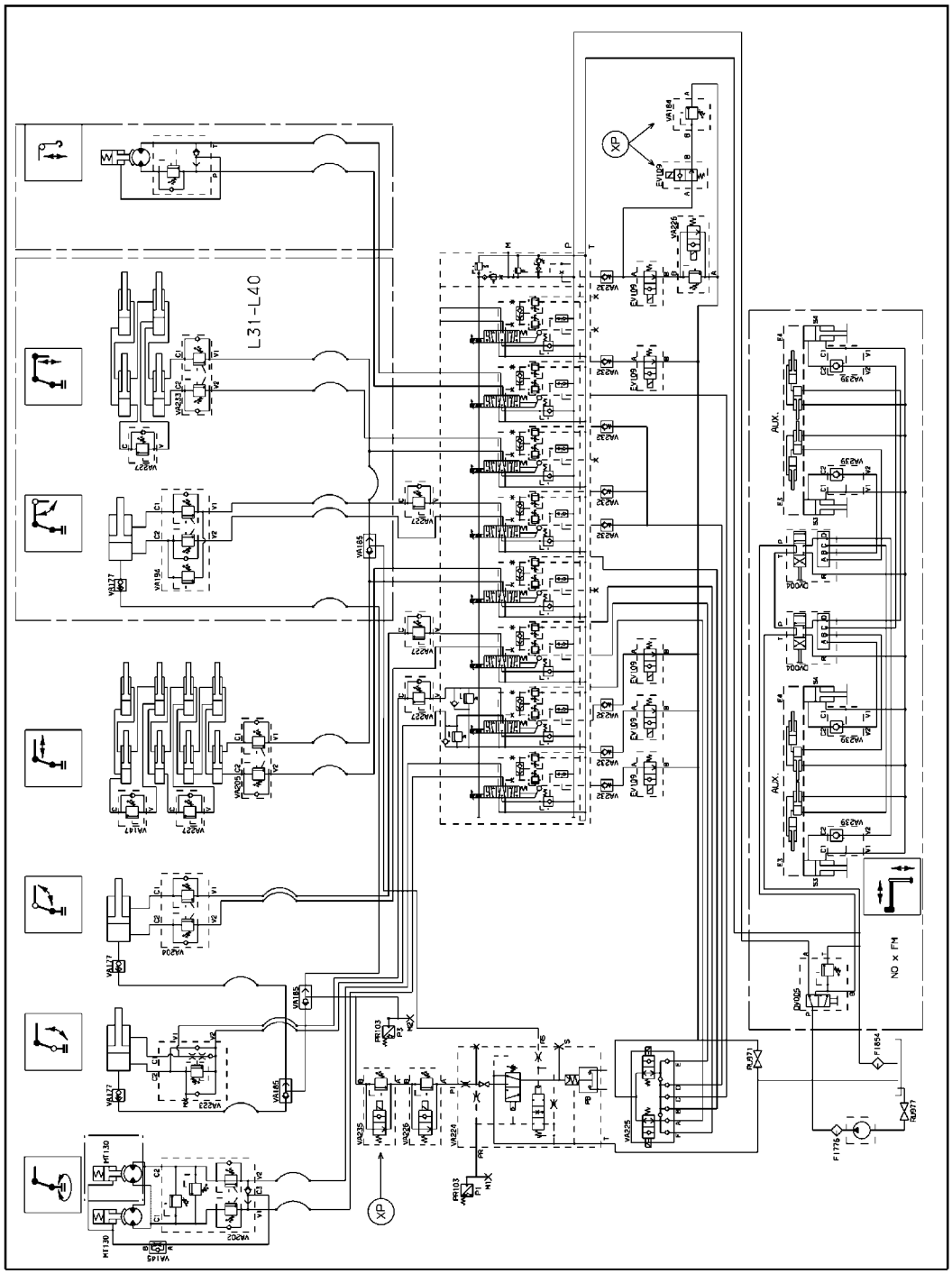
DE 1680
Do not use water to estinguish fire

TIRANTI:	NON SALDARE!
FIXING ROD:	DO NOT WELD!
TIRANTS:	NE PAS SOUDER!
ZUGSCHRAUBEN:	NICHT SCHWEISSEN!

DE 1574
Do not weld the fixing rods

S0 CE HYDRAULIC SCHEMATICS FOR CRANE

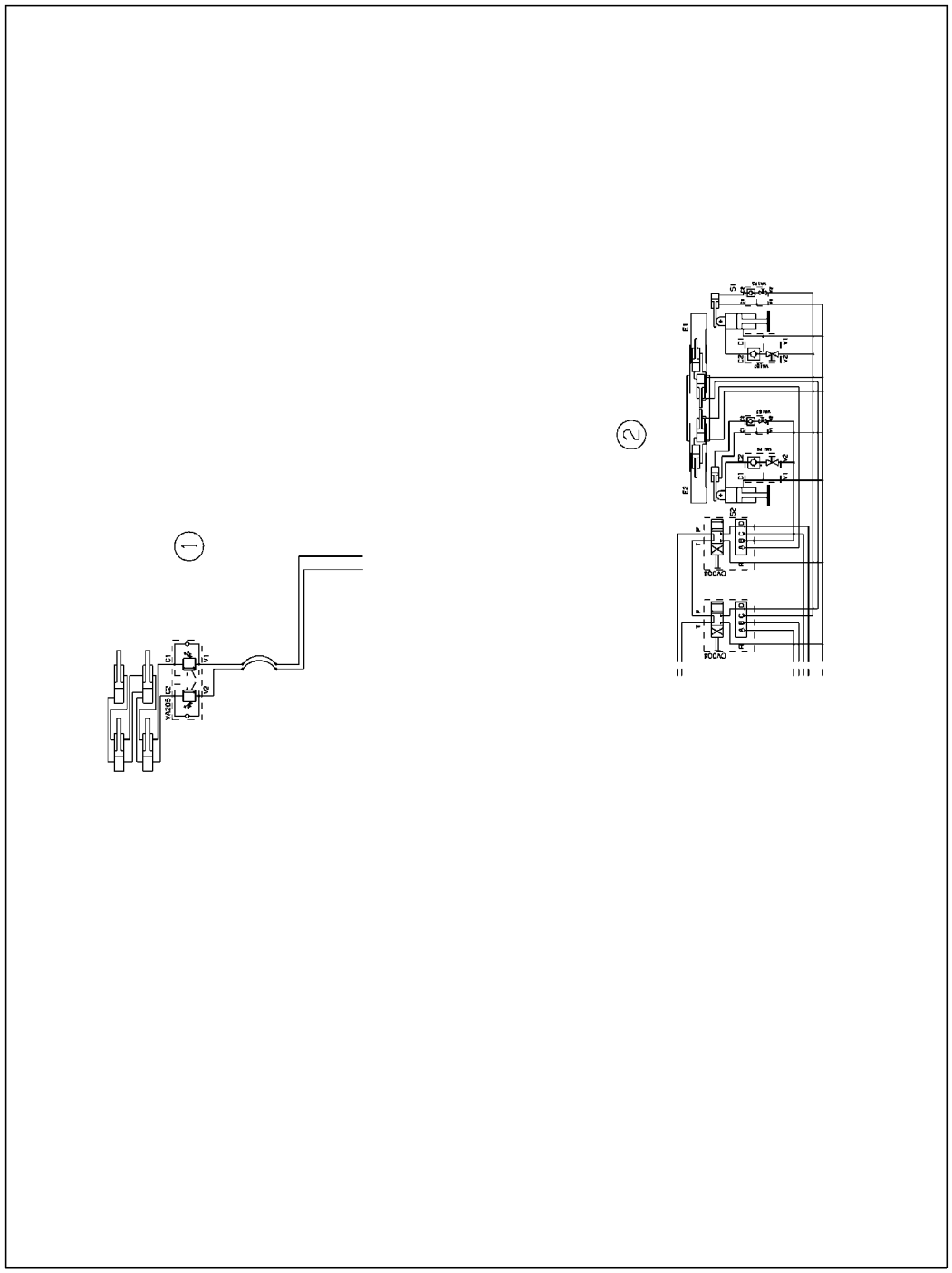
Hydraulic schematic for crane with Danfoss distributor - lifting moment limiting device “intelligent type”



CODE	*DESCRIPTION*
DV004	DEVIATOR
DV005	DEVIATOR
EV109	ELECTROVALVE
FI776	FILTER
M1/M2	GAUGE QUICK CONNECTION
MT130	MOTOREDUCER
PR103	PRESSURE SWITCH
RU971	FAUCET
RU977	FAUCET
VA102	DOUBLE EFFECT BLOCK VALVE
VA145	REGENERATIVE VALVE
VA175	BLOCK VALVE + FAUCET
VA177	ANTIBURST VALVE FOR LIFTING RAMS
VA185	SELECTOR VALVE
VA187	BLOCK VALVE + FAUCET
VA194	DOUBLE EFFECT BLOCK VALVE
VA202	OIL FLOW REGULATOR VALVE FOR ROTATION CYLINDER
VA204	DOUBLE EFFECT BLOCK VALVE
VA205	DOUBLE EFFECT BLOCK VALVE
VA217	SEQUENCE VALVE
VA223	SIMPLE EFFECT BLOCK VALVE
VA224	LIFTING MOMENT LIMITING DEVICE VALVE
VA225	LEVEL SENSOR VALVE
VA226	ELECTRIC MAIN WITH BY PASS VALVE
VA227	SEQUENCE VALVE
VA232	UNIDIRECTIONAL VALVE
VA233	DOUBLE EFFECT BLOCK VALVE
VA226	ELECTRIC MAIN WITH BY PASS VALVE

Edition 10.11.2000

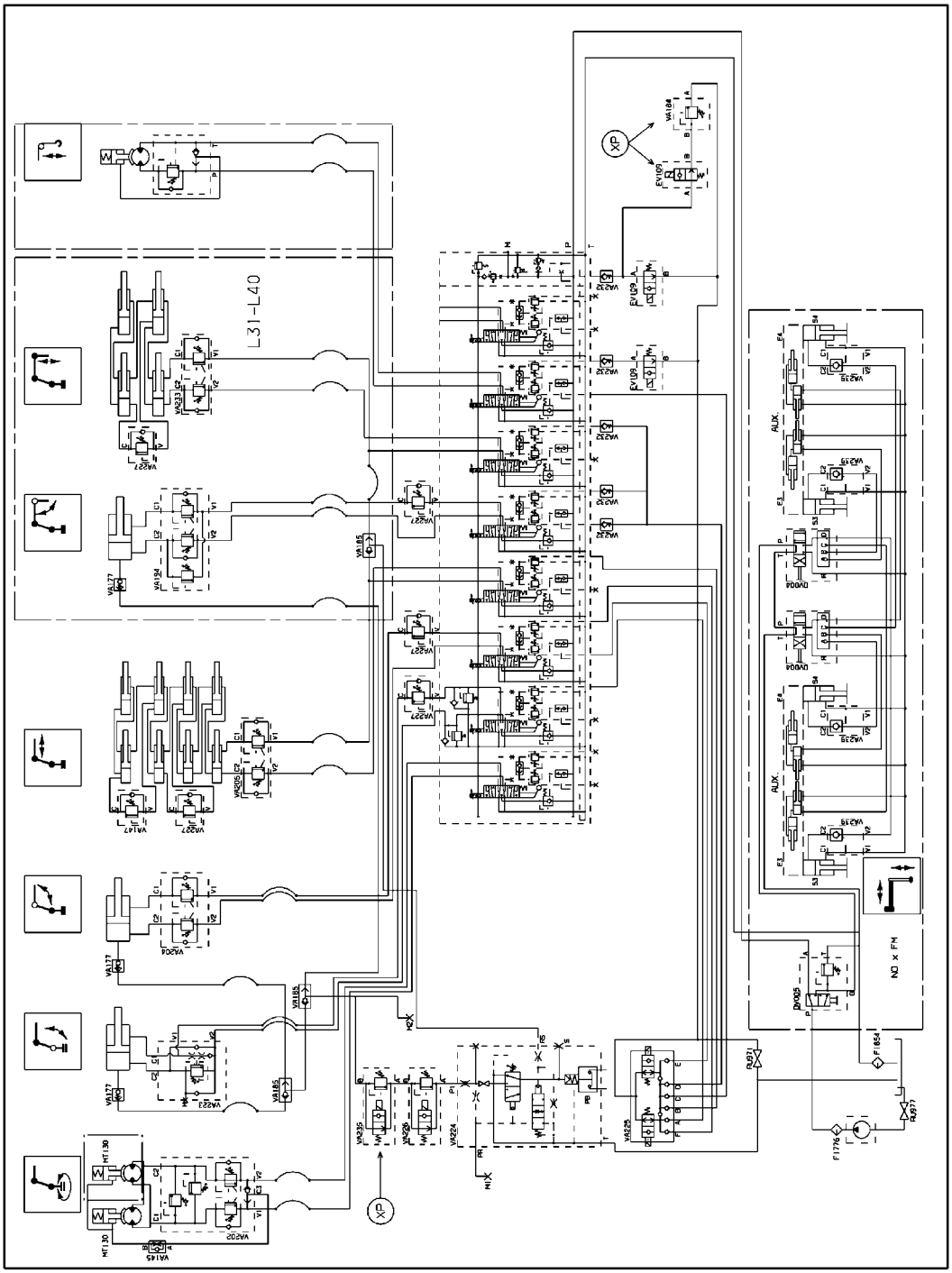
Hydraulic schematic for crane - versions:
1) F480A.24 - F530AXP.24
2) hydraulic rotating stabilizers



CODE	*DESCRIPTION*
DV004	DEVIATOR
VA175	BLOCK VALVE + FAUCET
VA187	BLOCK VALVE + FAUCET
VA205	DOUBLE EFFECT BLOCK VALVE

S1 HYDRAULIC SCHEMATICS FOR CRANE

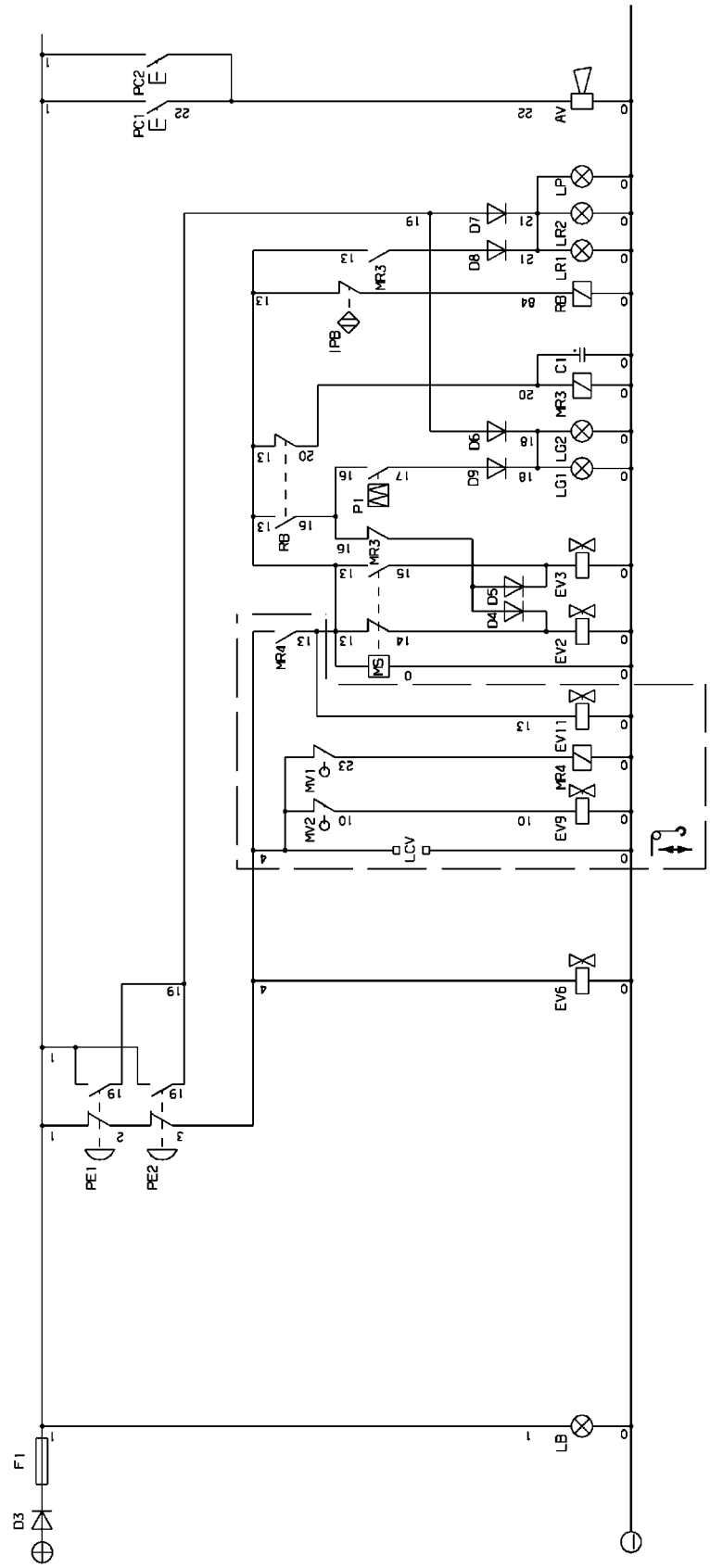
Hydraulic schematic for crane - Danfoss distributor - lifting moment limiting device “intelligent type”



CODE	DESCRIPTION
DV004	DEVIATOR
DV005	DEVIATOR
EV109	ELECTROVALVE
FI776	FILTER
M1/M2	GAUGE QUICK CONNECTION
MT130	MOTOREDUCER
RU971	FAUCET
RU977	FAUCET
VA102	DOUBLE EFFECT BLOCK VALVE
VA145	REGENERATIVE VALVE
VA175	BLOCK VALVE + FAUCET
VA177	ANTIBURST VALVE FOR LIFTING RAMS
VA185	SELECTOR VALVE
VA187	BLOCK VALVE + FAUCET
VA194	DOUBLE EFFECT BLOCK VALVE
VA202	OIL FLOW REGULATOR VALVE FOR ROTATION CYLINDER
VA204	DOUBLE EFFECT BLOCK VALVE
VA205	DOUBLE EFFECT BLOCK VALVE
VA217	SEQUENCE VALVE
VA223	SIMPLE EFFECT BLOCK VALVE
VA224	LIFTING MOMENT LIMITING DEVICE VALVE
VA225	LEVEL SENSOR VALVE
VA226	ELECTRIC MAIN WITH BY PASS VALVE
VA227	SEQUENCE VALVE
VA232	UNIDIRECTIONAL VALVE
VA233	DOUBLE EFFECT BLOCK VALVE
VA235	ELECTRIC MAIN WITH BY PASS VALVE

T0 CE ELECTRIC SCHEMATICS FOR CRANE

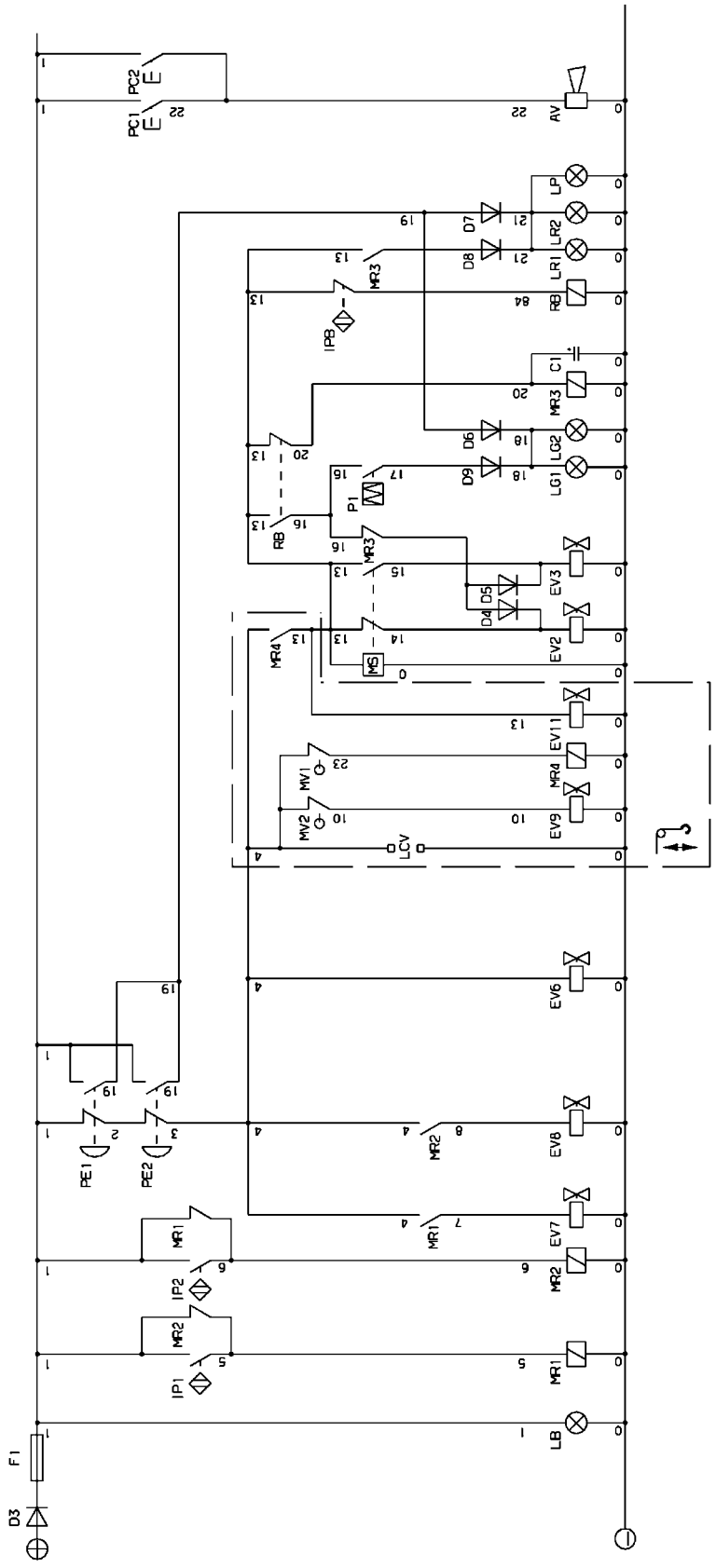
Electric schematic for crane - Danfoss distributor - free rotation



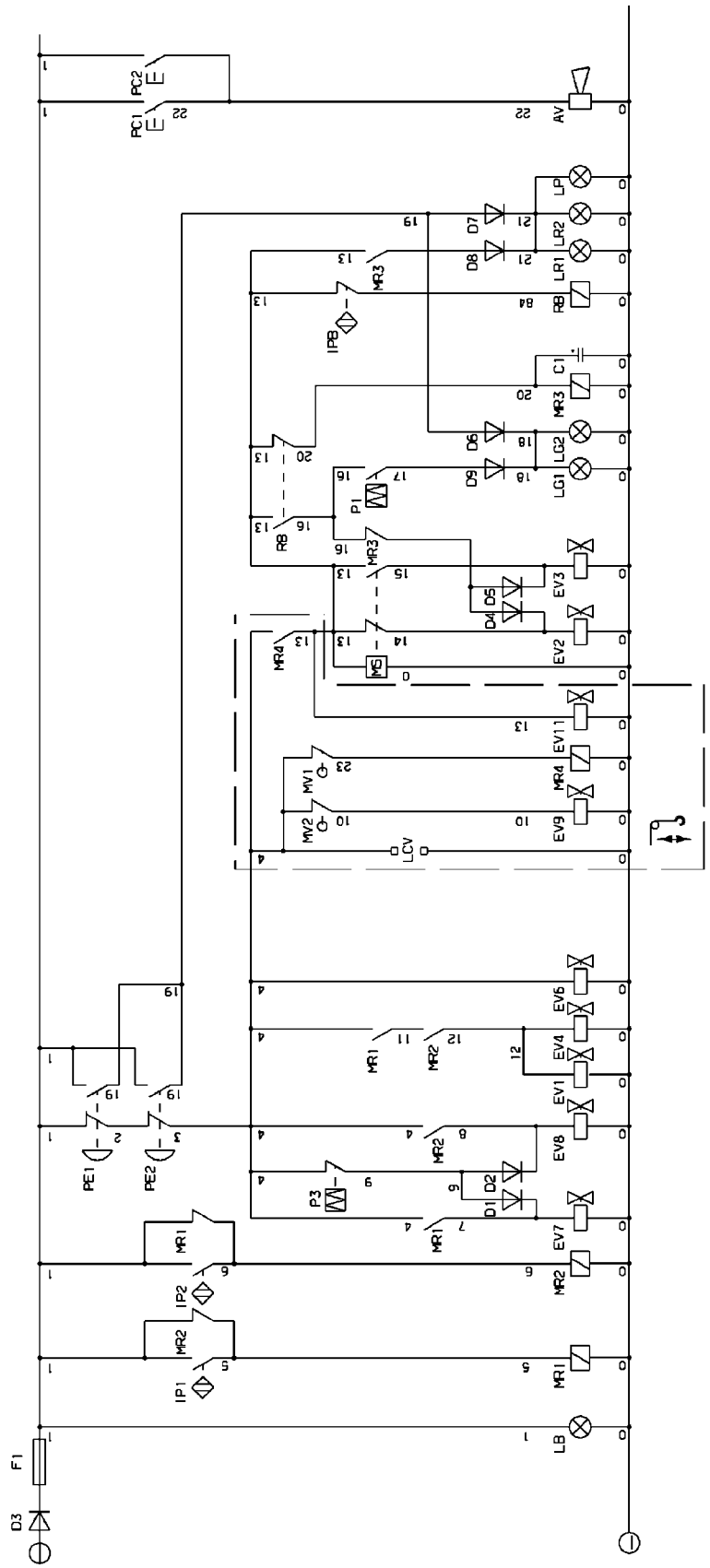
CODE	*DESCRIPTION*
ALIM	FEED MAIN CONTROL PANEL
AV	ACOUSTIC ALARM
D1	LAMP TEST DIODE
D2	LAMP TEST DIODE
D3	POLARITY PROTECTION DIODE
EV1	EMERGENCY ELECTROVALVE
EV2	ELECTROVALVE FOR CRANE LIFTING BLOCK
EV3	ELECTROVALVE FOR CRANE DESCENTS BLOCK
F1	PROTECTION FUSE 10 A.
LB	WHITE WARNING LIGHT FOR FEED TO PANEL
LG1	YELLOW WARNING LIGHT FOR MAIN CONTROL PANEL 90% LOAD REACHING
LG2	YELLOW WARNING LIGHT FOR DOUBLE CONTROL SATELLITE 90% LOAD REACHING
LG3	YELLOW WARNING LIGHT FOR ADDITIONAL SATELLITE 90% LOAD REACHING
LP	ADDITIONAL FLASHING
LR1	RED WARNING LIGHT FOR MAIN CONTROL PANEL BLOCK
LR2	RED WARNING LIGHT FOR DOUBLE CONTROL SATELLITE BLOCK
LR3	RED WARNING LIGHT FOR ADDITIONAL SATELLITE BLOCK
MS	MERCURY SLOPE SENSOR ON OUTER BOOM
P1	LOAD PRESSURE 90% DETECTOR
P2	BLOCK PRESSURE DETECTOR
PC1	ACOUSTIC WARNING BUTTON FOR MAIN CONTROL PANEL
PC2	ACOUSTIC WARNING BUTTON FOR DOUBLE CONTROL SATELLITE
PC3	ACOUSTIC WARNING BUTTON FOR ADDITIONAL SATELLITE
PE1	MAIN CONTROL PANEL EMERGENCY BUTTON
PE2	DOUBLE CONTROL SATELLITE EMERGENCY BUTTON
PE3	ADDITIONAL SATELLITE EMERGENCY BUTTON
SAT2	DOUBLE CONTROL SIDE SATELLITE
SAT3	ADDITIONAL SATELLITE
WINCH	
AR1	CRANE WINDING
AR2	EXTENSION WINDING
LCV	WINCH LOAD LIMITING DEVICE
LV1	MICRO LEVER FOR CABLE WINDING REACTIVATION
LV2	MICRO LEVER FOR CABLE UNWINDING REACTIVATION
MV1	PULLEY MICRO WINCH
MV2	DRUM MICRO WINCH
XP	
EVX1	XP ELECTROVALVE
EVX2	ELECTROVALVE FOR EXTRA PRESSURE (XP) OF THE LIMITING DEVICE
S1	KEY SELECTOR 1° CONTROL STATION
S2	KEY SELECTOR 2° CONTROL STATION
S3	KEY SELECTOR 3° CONTROL STATION

Electric schematic for crane - Danfoss distributor - limited rotation

CODE	*DESCRIPTION*
ALIM	FEED MAIN CONTROL PANEL
AV	ACOUSTIC ALARM
D1	LAMP TEST DIODE
D2	LAMP TEST DIODE
D3	POLARITY PROTECTION DIODE
EV1	EMERGENCY ELECTROVALVE
EV2	ELECTROVALVE FOR CRANE LIFTING BLOCK
EV3	ELECTROVALVE FOR CRANE DESCENTS BLOCK
F1	PROTECTION FUSE 10 A.
IP1	CLOCKWISE ROTATION PROXIMITY
IP2	ANTICLOCKWISE ROTATION PROXIMITY
LB	WHITE WARNING LIGHT FOR FEED TO PANEL
LG1	YELLOW WARNING LIGHT FOR MAIN CONTROL PANEL 90% LOAD REACHING
LG2	YELLOW WARNING LIGHT FOR DOUBLE CONTROL SATELLITE 90% LOAD REACHING
LG3	YELLOW WARNING LIGHT FOR ADDITIONAL SATELLITE 90% LOAD REACHING
LMR1	CLOCKWISE ROTATION MICRO REACTIVATION
LMR2	ANTICLOCKWISE ROTATION MICRO REACTIVATION
LP	ADDITIONAL FLASHING
LR1	RED WARNING LIGHT FOR MAIN CONTROL PANEL BLOCK
LR2	RED WARNING LIGHT FOR DOUBLE CONTROL SATELLITE BLOCK
LR3	RED WARNING LIGHT FOR ADDITIONAL SATELLITE BLOCK
MR1	CLOCKWISE ROTATION RELAY
MR2	ANTICLOCKWISE ROTATION RELAY
MS	MERCURY SLOPE SENSOR ON OUTER BOOM
P1	LOAD PRESSURE 90% DETECTOR
P2	BLOCK PRESSURE DETECTOR
PC1	ACOUSTIC WARNING BUTTON FOR MAIN CONTROL PANEL
PC2	ACOUSTIC WARNING BUTTON FOR DOUBLE CONTROL SATELLITE
PC3	ACOUSTIC WARNING BUTTON FOR ADDITIONAL SATELLITE
PE1	MAIN CONTROL PANEL EMERGENCY BUTTON
PE2	DOUBLE CONTROL SATELLITE EMERGENCY BUTTON
PE3	ADDITIONAL SATELLITE EMERGENCY BUTTON
SAT2	DOUBLE CONTROL SIDE SATELLITE
SAT3	ADDITIONAL SATELLITE
SDP	SEAT PROXIMITY SHUNT BOX
WINCH	
AR1	CRANE WINDING
AR2	EXTENSION WINDING
LCV	WINCH LOAD LIMITING DEVICE
LV1	MICRO LEVER FOR CABLE WINDING REACTIVATION
LV2	MICRO LEVER FOR CABLE UNWINDING REACTIVATION
MV1	PULLEY MICRO WINCH
MV2	DRUM MICRO WINCH
XP	
EVX1	XP ELECTROVALVE
EVX2	ELECTROVALVE FOR EXTRA PRESSURE (XP) OF THE LIMITING DEVICE
S1	KEY SELECTOR 1° CONTROL STATION
S2	KEY SELECTOR 2° CONTROL STATION
S3	KEY SELECTOR 3° CONTROL STATION

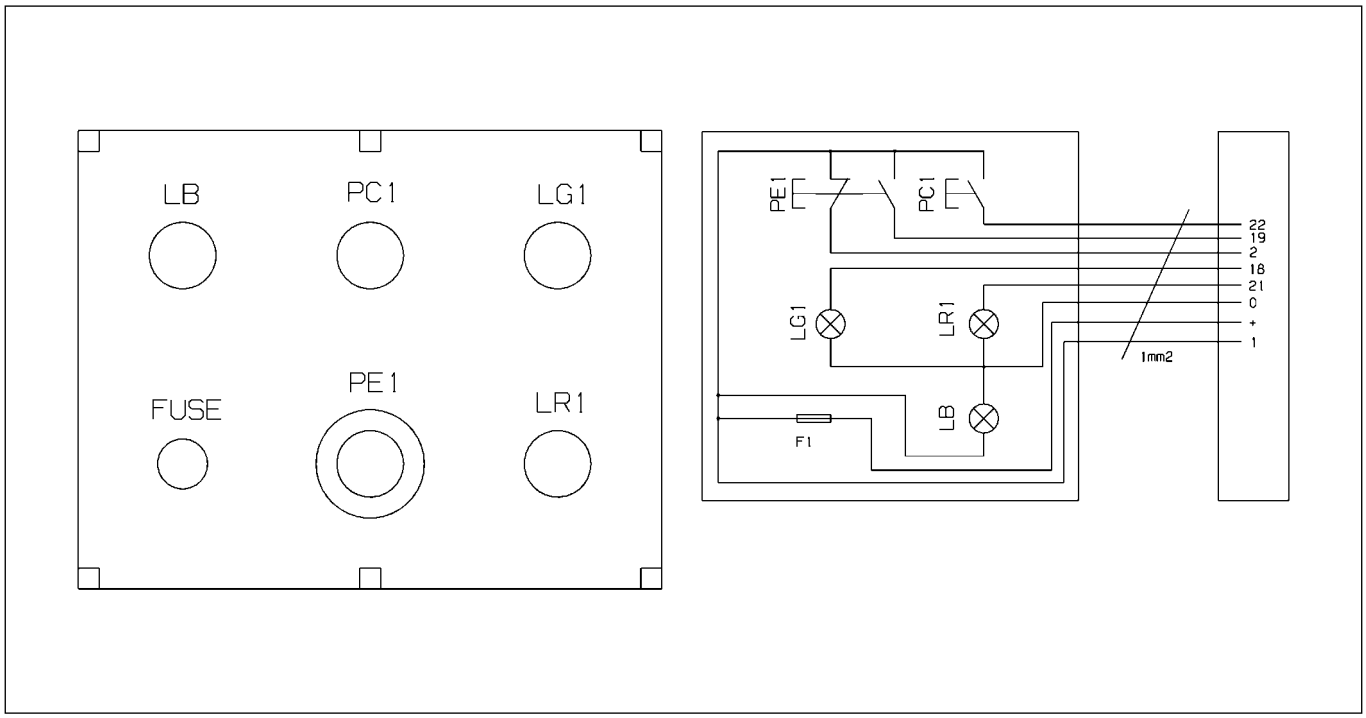


Edition 10.11.2000

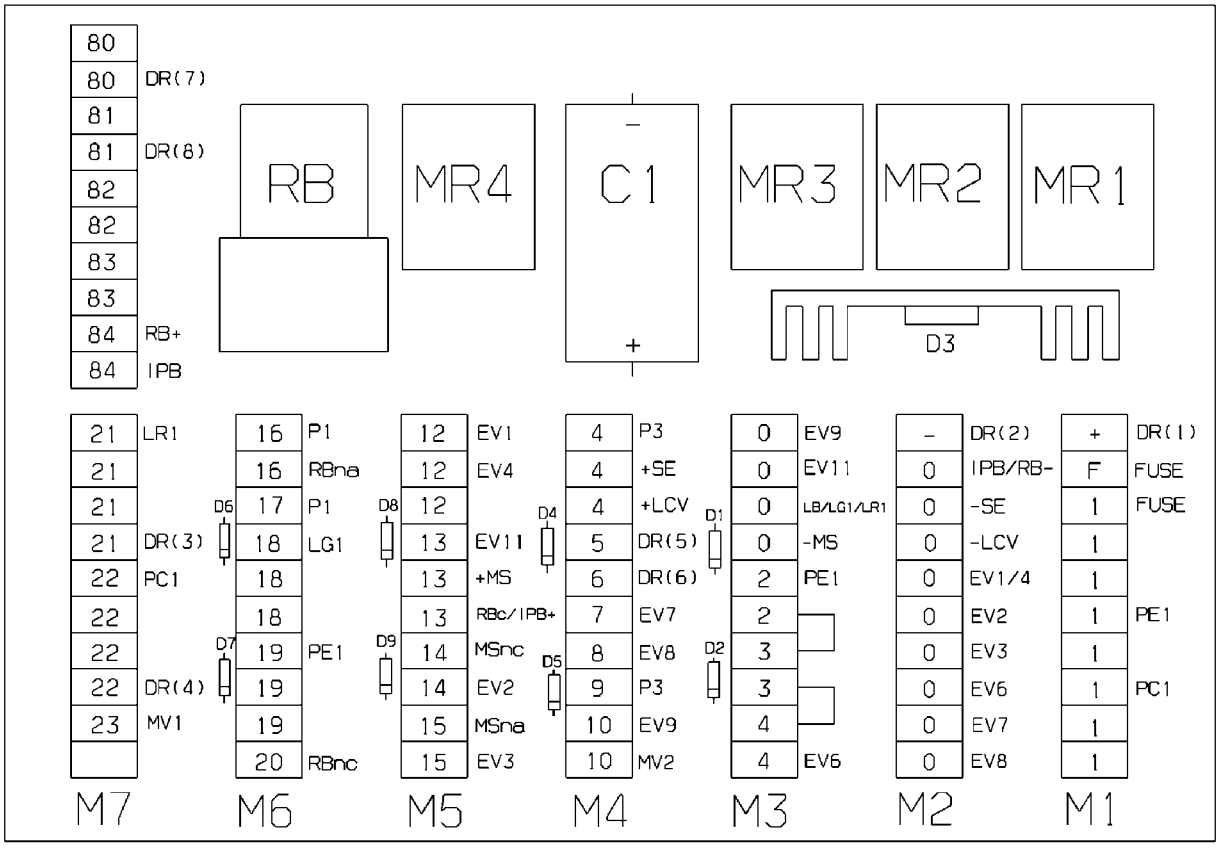


CODE	*DESCRIPTION*
ALIM	FEED MAIN CONTROL PANEL
AV	ACOUSTIC ALARM
D1	LAMP TEST DIODE
D2	LAMP TEST DIODE
D3	POLARITY PROTECTION DIODE
EV1	EMERGENCY ELECTROVALVE
EV2	ELECTROVALVE FOR CRANE LIFTING BLOCK
EV3	ELECTROVALVE FOR CRANE DESCENTS BLOCK
EV6	ELECTROVALVE FOR CRANE LIFTING MOMENT LIMITING DEVICE OF THE TWO WORKING ZONES
EV7	ELECTROVALVE FOR LIMITING GENERAL PRESSION
F1	PROTECTION FUSE 10 A.
IP1	CLOCKWISE ROTATION PROXIMITY
IP2	ANTICLOCKWISE ROTATION PROXIMITY
LB	WHITE WARNING LIGHT FOR FEED TO PANEL
LG1	YELLOW WARNING LIGHT FOR MAIN CONTROL PANEL 90% LOAD REACHING
LG2	YELLOW WARNING LIGHT FOR DOUBLE CONTROL SATELLITE 90% LOAD REACHING
LG3	YELLOW WARNING LIGHT FOR ADDITIONAL SATELLITE 90% LOAD REACHING
LMR1	CLOCKWISE ROTATION MICRO REACTIVATION
LMR2	ANTICLOCKWISE ROTATION MICRO REACTIVATION
LP	ADDITIONAL FLASHING
LR1	RED WARNING LIGHT FOR MAIN CONTROL PANEL BLOCK
LR2	RED WARNING LIGHT FOR DOUBLE CONTROL SATELLITE BLOCK
LR3	RED WARNING LIGHT FOR ADDITIONAL SATELLITE BLOCK
MR1	CLOCKWISE ROTATION RELAY
MR2	ANTICLOCKWISE ROTATION RELAY
MS	MERCURY SLOPE SENSOR ON OUTER BOOM
P1	LOAD PRESSURE 90% DETECTOR
P2	BLOCK PRESSURE DETECTOR
P4	ROTATION CONTROL PRESSURE DETECTOR
PC1	ACOUSTIC WARNING BUTTON FOR MAIN CONTROL PANEL
PC2	ACOUSTIC WARNING BUTTON FOR DOUBLE CONTROL SATELLITE
PC3	ACOUSTIC WARNING BUTTON FOR ADDITIONAL SATELLITE
PE1	MAIN CONTROL PANEL EMERGENCY BUTTON
PE2	DOUBLE CONTROL SATELLITE EMERGENCY BUTTON
PE3	ADDITIONAL SATELLITE EMERGENCY BUTTON
SAT2	DOUBLE CONTROL SIDE SATELLITE
SAT3	ADDITIONAL SATELLITE
SDP	SEAT PROXIMITY SHUNT BOX
WINCH	
AR1	CRANE WINDING
AR2	EXTENSION WINDING
LCV	WINCH LOAD LIMITING DEVICE
LV1	MICRO LEVER FOR CABLE WINDING REACTIVATION
LV2	MICRO LEVER FOR CABLE UNWINDING REACTIVATION
MV1	PULLEY MICRO WINCH
MV2	DRUM MICRO WINCH
XP	
EVX1	XP ELECTROVALVE
EVX2	ELECTROVALVE FOR EXTRA PRESSURE (XP) OF THE LIMITING DEVICE
S1	KEY SELECTOR 1° CONTROL STATION
S2	KEY SELECTOR 2° CONTROL STATION
S3	KEY SELECTOR 3° CONTROL STATION

Electric schematic for crane - main control panel - Danfoss distributor

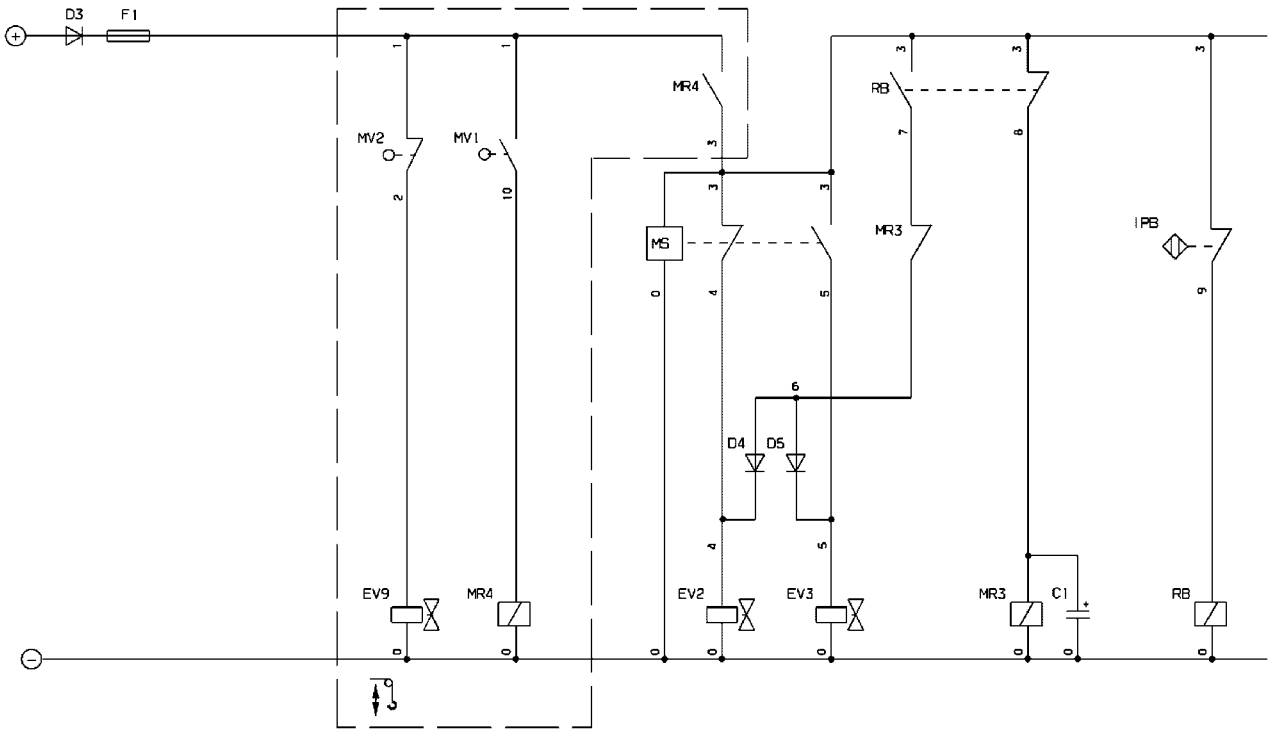


Electric schematic for crane - printed electric card - Danfoss distributor - seat box version



T1 ELECTRIC SCHEMATICS FOR CRANE

Electric schematic for crane - Danfoss distributor - free rotation



CODE	*DESCRIPTION*
ALIM	FEED MAIN CONTROL PANEL
C1	BLOCK DELAY CONDENSOR
D3	POLARITY PROTECTION DIODE
EV2	ELECTROVALVE FOR CRANE LIFTING BLOCK
EV3	ELECTROVALVE FOR CRANE DESCENTS BLOCK
F1	PROTECTION FUSE 5A
IPB	PROXIMITY SENSOR VALVE
MR3	RELAY FOR BLOCK DELAY
MS	MERCURY SLOPE SENSOR ON OUTER BOOM
RADIO	CABLE FOR REMOTE CONTROL CONNECTION
RB	LMLD BLOCK SIGNAL RELAY

WINCH	
AR1	CRANE WINDING
EV9	WINCH DESCENT BLOCK ELECTROVALVE
MR4	WINCH RELAY
MV1	PULLEY MICRO WINCH
MV2	DRUM MICRO WINCH
S1	PIN + PLUG FOR WINCH END STROKE
SDV	WINCH PROXIMITY SHUNT BOX

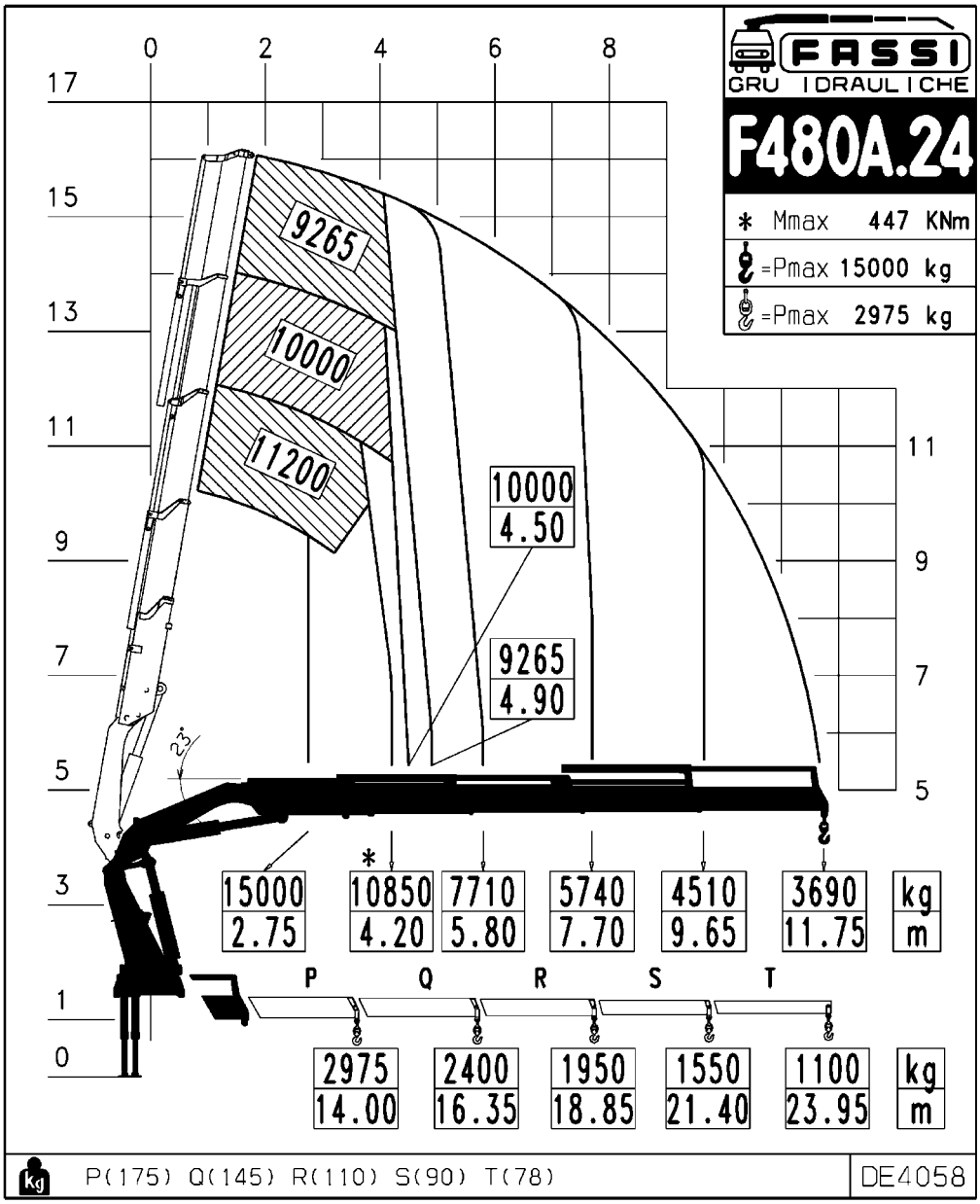
V0 CE CAPACITY PLATES FOR CRANE WITH LIFTING MOMENT LIMITING DEVICE

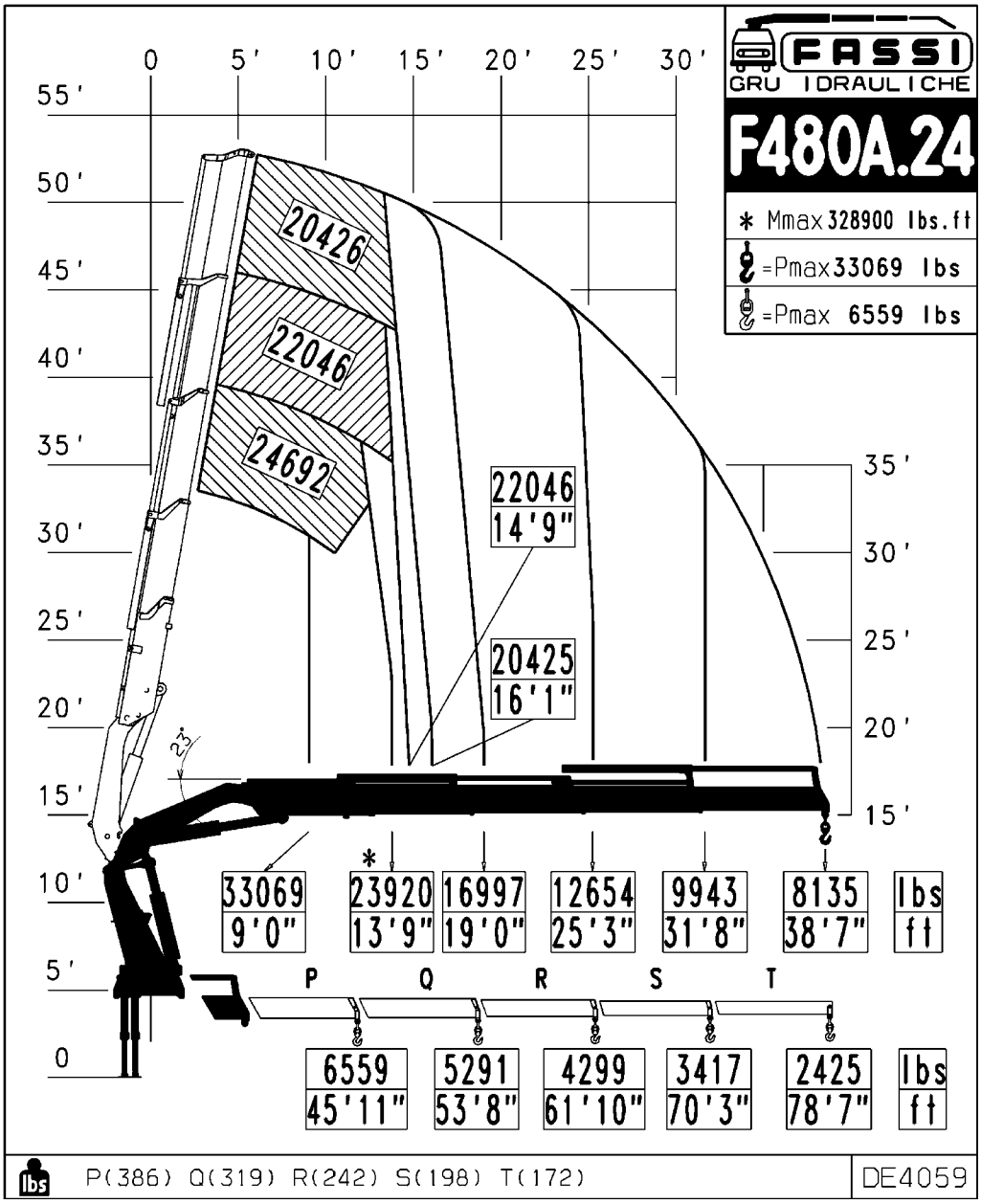
For cranes and manual extensions.
For cranes and manual extensions with winch.
For hydraulic jib and manual extensions.
For hydraulic jib and manual extensions with winch.

The represented plates refer to the nominal design capacities.

(!) WARNING (!)

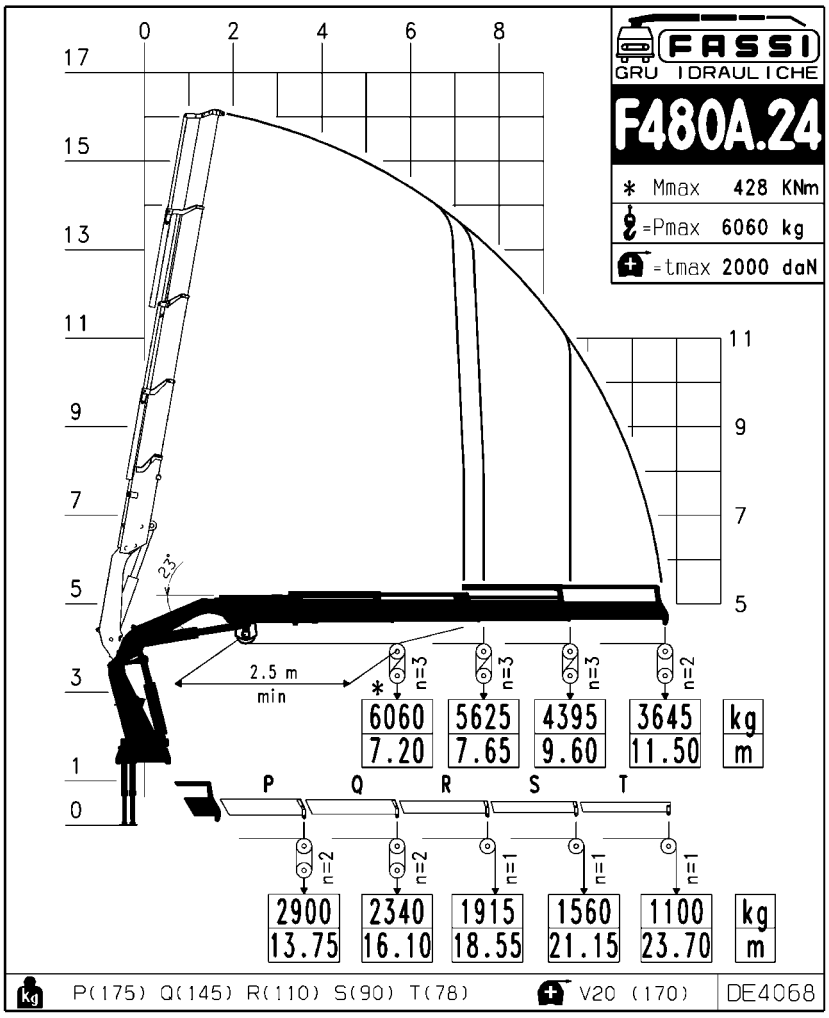
If the capacities are downgraded or partially reduced (e.g. sector in front of vehicle cab) capacity plates must be applied in line with the final test figures.

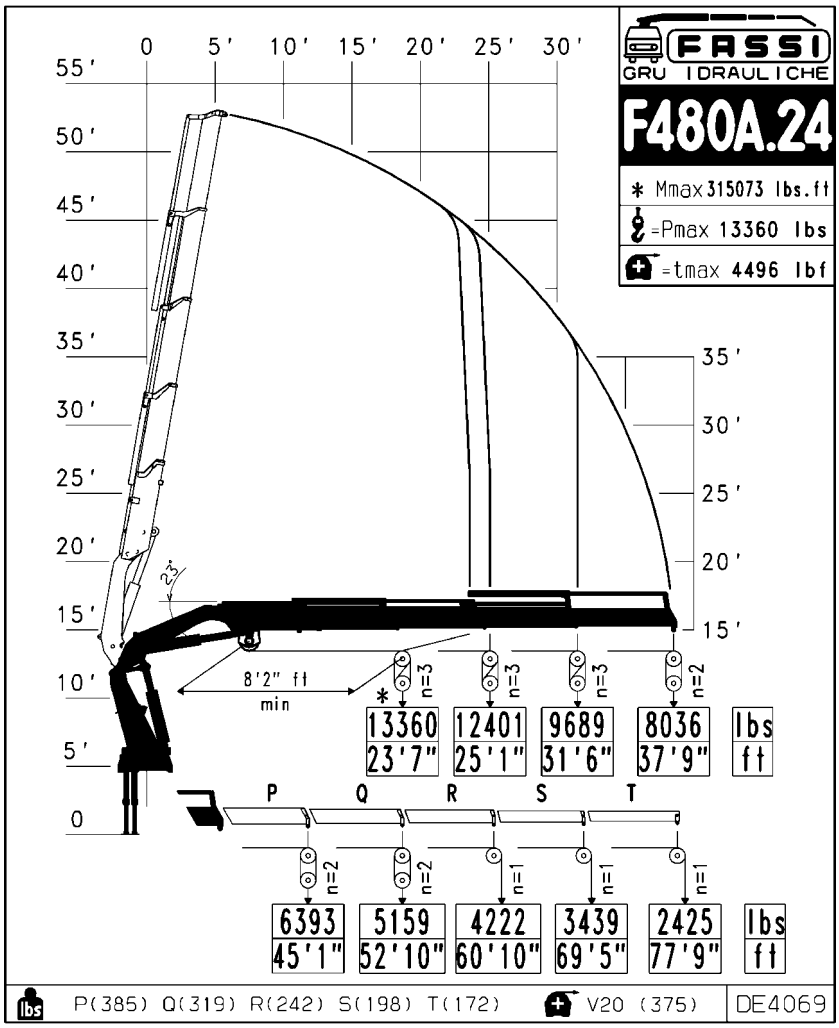


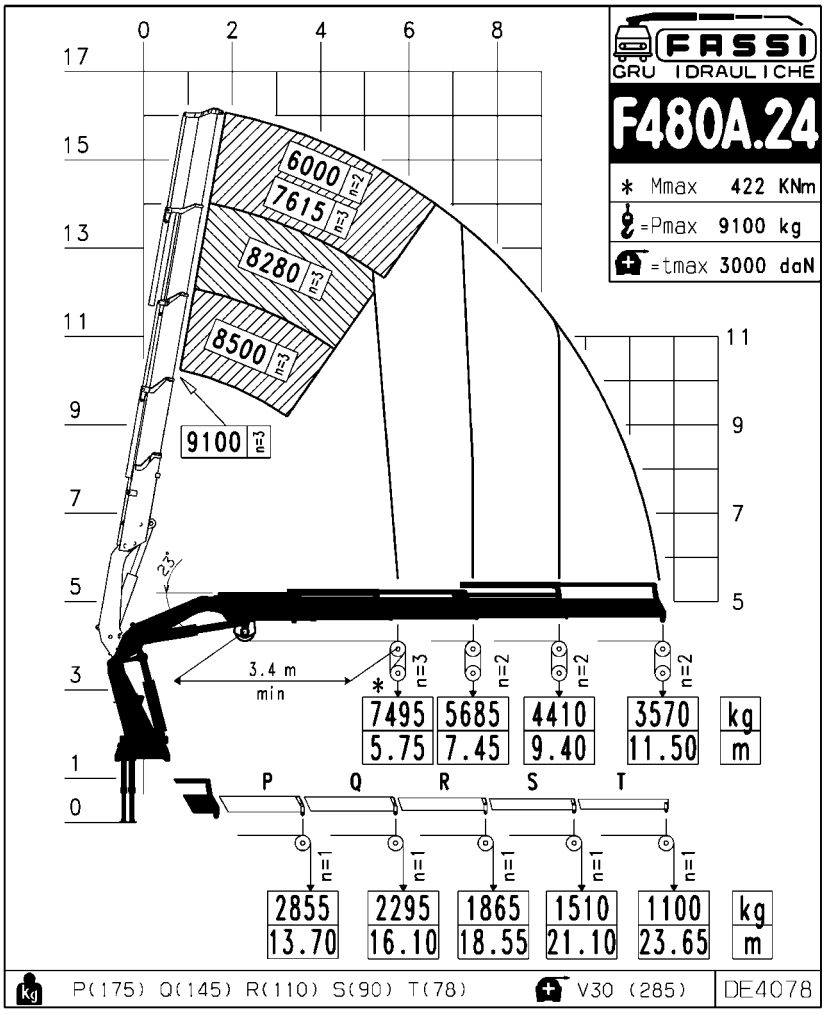

FASSI
GRU IDRAULICHE
F480A.24
* Mmax 328900 lbs.ft
=Pmax 33069 lbs
=Pmax 6559 lbs
0 5' 10' 15' 20' 25' 30'
55'
50'
45'
40'
35'
30'
25'
20'
15'
10'
5'
0
20426
22046
24692
22046
14'9"
20425
16'1"
23°
35'
30'
25'
20'
15'
33069 9'0"
* 23920 13'9"
16997 19'0"
12654 25'3"
9943 31'8"
8135 38'7"
lbs
ft
P Q R S T
6559 45'11"
5291 53'8"
4299 61'10"
3417 70'3"
2425 78'7"
lbs
ft
P(386) Q(319) R(242) S(198) T(172)
DE4059

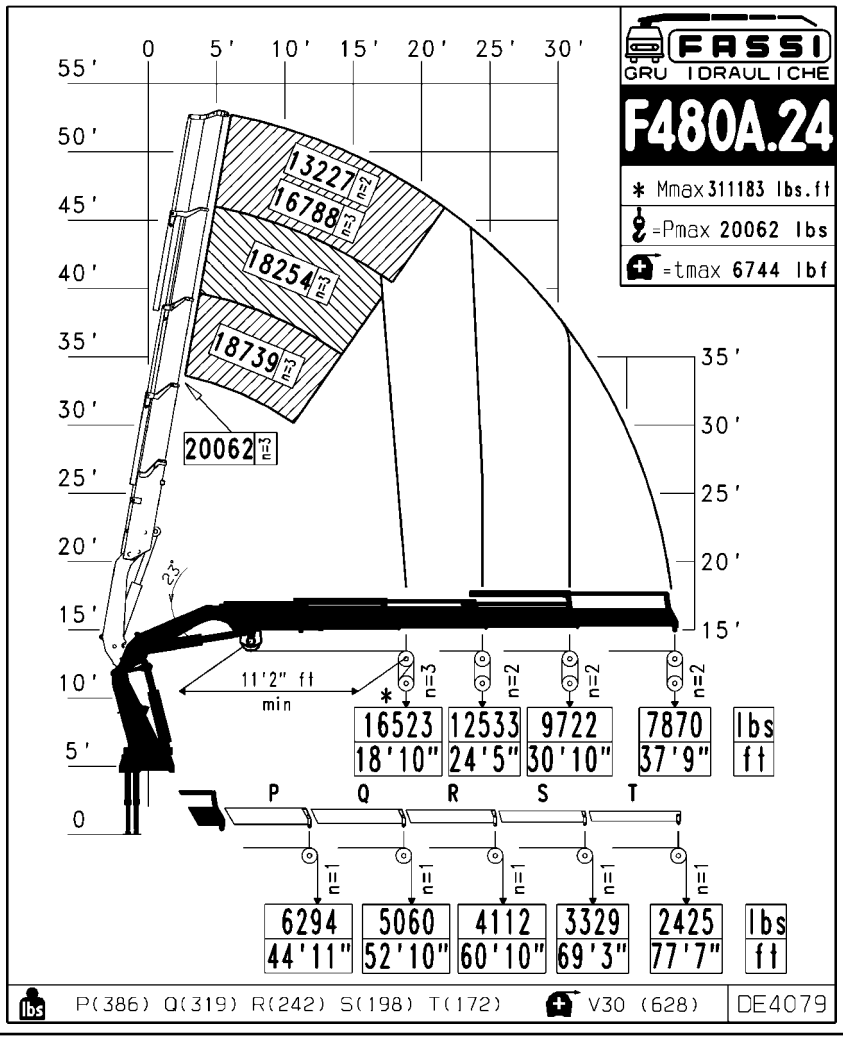
CAPACITY PLATES FOR CRANE WITH LIFTING MOMENT LIMITING DEVICE

F 480A.24



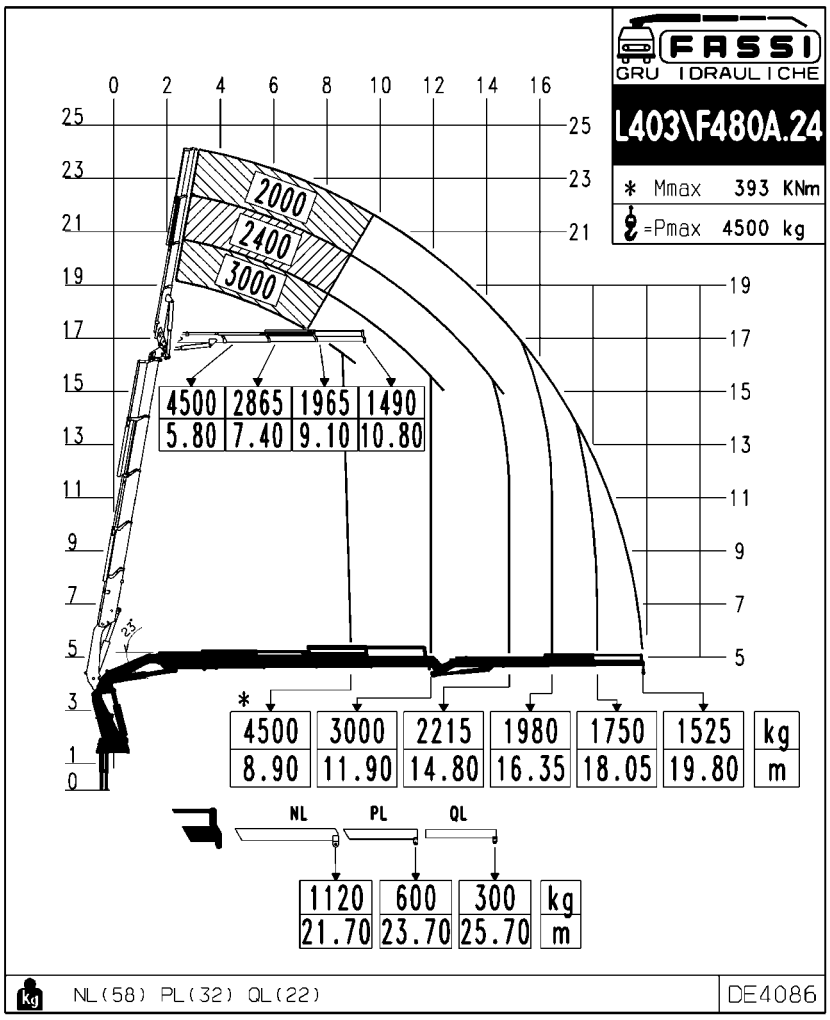


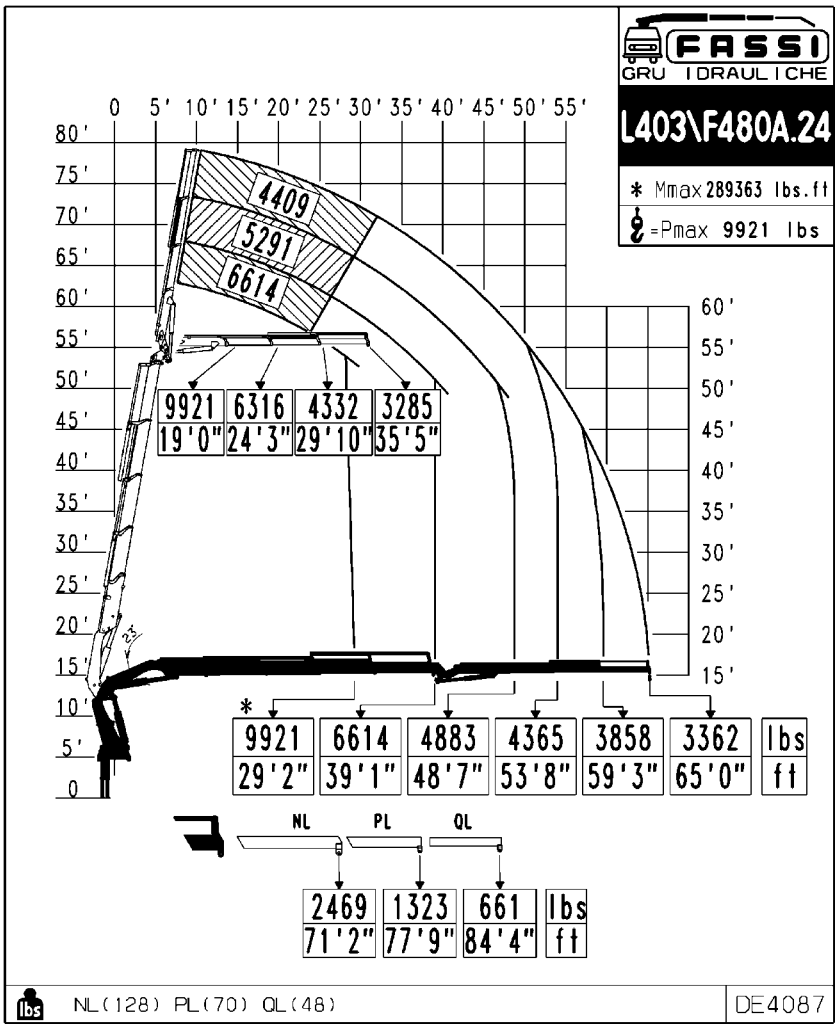

FASSI
GRU IDRAULICHE
F480A.24
* Mmax 422 KNm
=Pmax 9100 kg
=tmax 3000 daN
6000
7615
8280
8500
9100
3.4 m
min
7495 5.75
5685 7.45
4410 9.40
3570 11.50
kg m
P Q R S T
2855 13.70
2295 16.10
1865 18.55
1510 21.10
1100 23.65
kg m
P(175) Q(145) R(110) S(90) T(78)
V30 (285)
DE4078

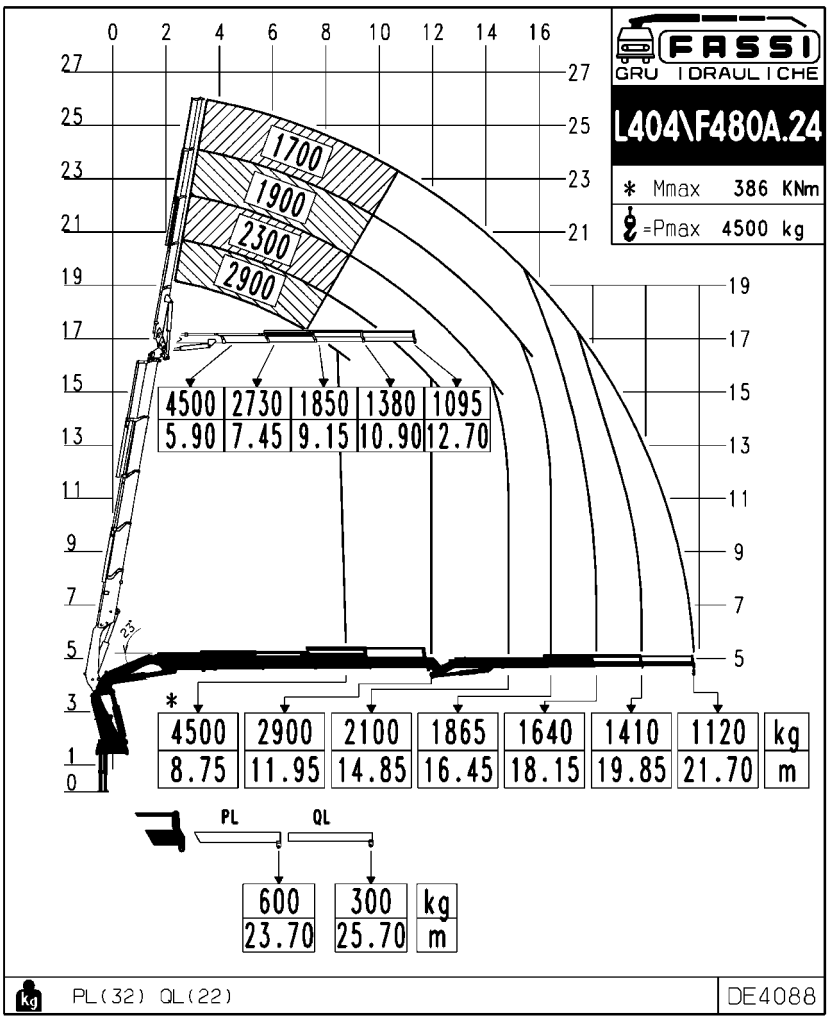

FASSI
GRU IDRAULICHE
F480A.24
* Mmax 311183 lbs.ft
=Pmax 20062 lbs
=tmax 6744 lbf
13227
16788
18254
18739
20062
11'2" ft
min
16523 18'10"
12533 24'5"
9722 30'10"
7870 37'9"
lbs ft
P Q R S T
6294 44'11"
5060 52'10"
4112 60'10"
3329 69'3"
2425 77'7"
lbs ft
P(386) Q(319) R(242) S(198) T(172)
V30 (628)
DE4079

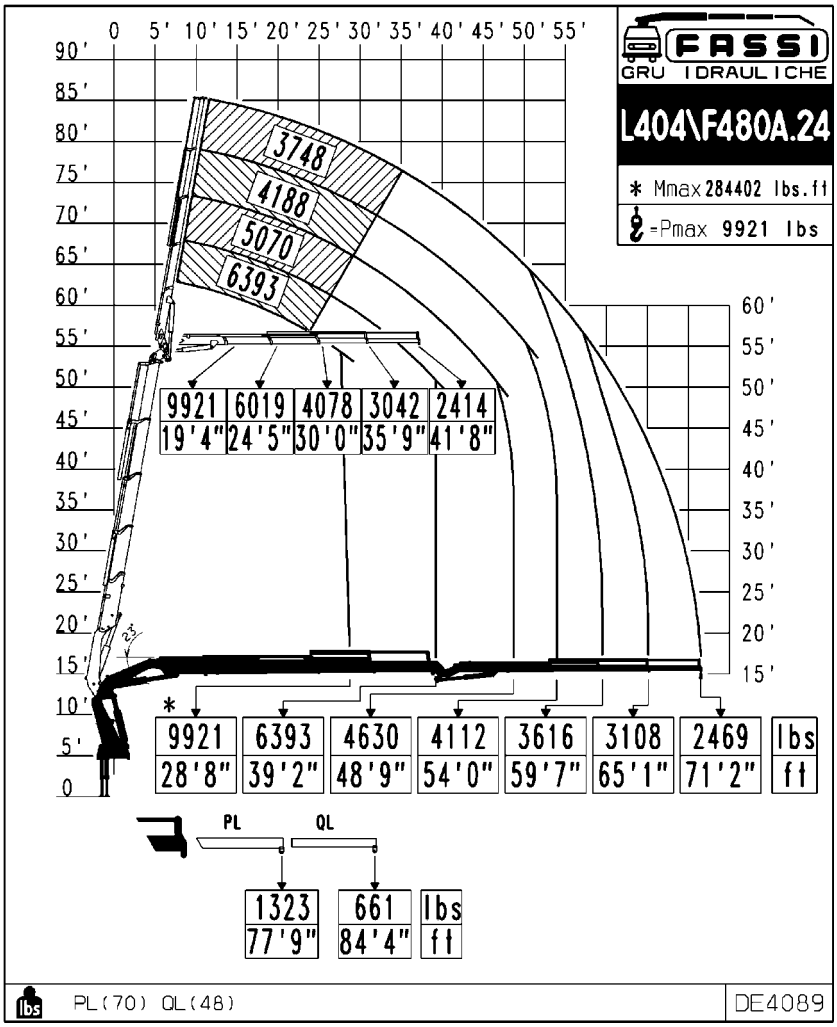
CAPACITY PLATES FOR CRANE WITH LIFTING MOMENT LIMITING DEVICE

F 480A.24



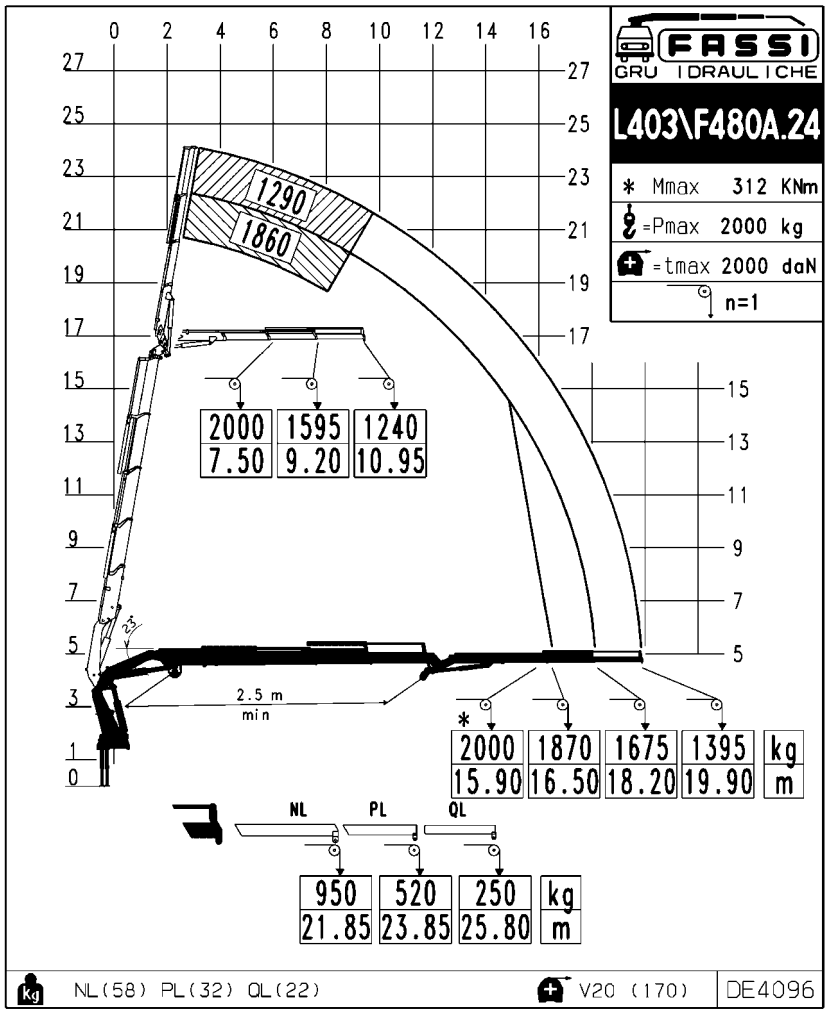


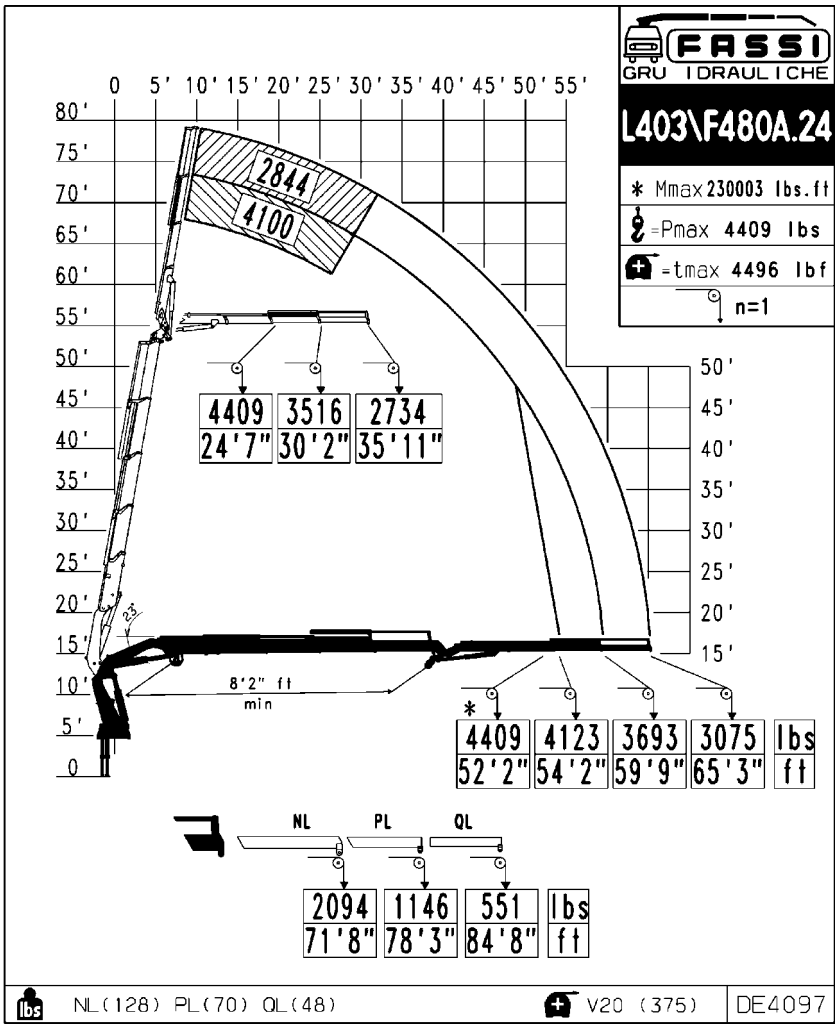

FASSI GRU IDRAULICHE
L404\F480A.24
* Mmax 386 KNm
=Pmax 4500 kg
1700
1900
2300
2900
4500 | 2730 | 1850 | 1380 | 1095
5.90 | 7.45 | 9.15 | 10.90 | 12.70
4500 | 2900 | 2100 | 1865 | 1640 | 1410 | 1120 | kg
8.75 | 11.95 | 14.85 | 16.45 | 18.15 | 19.85 | 21.70 | m
PL QL
600 | 300 | kg
23.70 | 25.70 | m
PL(32) QL(22)
DE4088

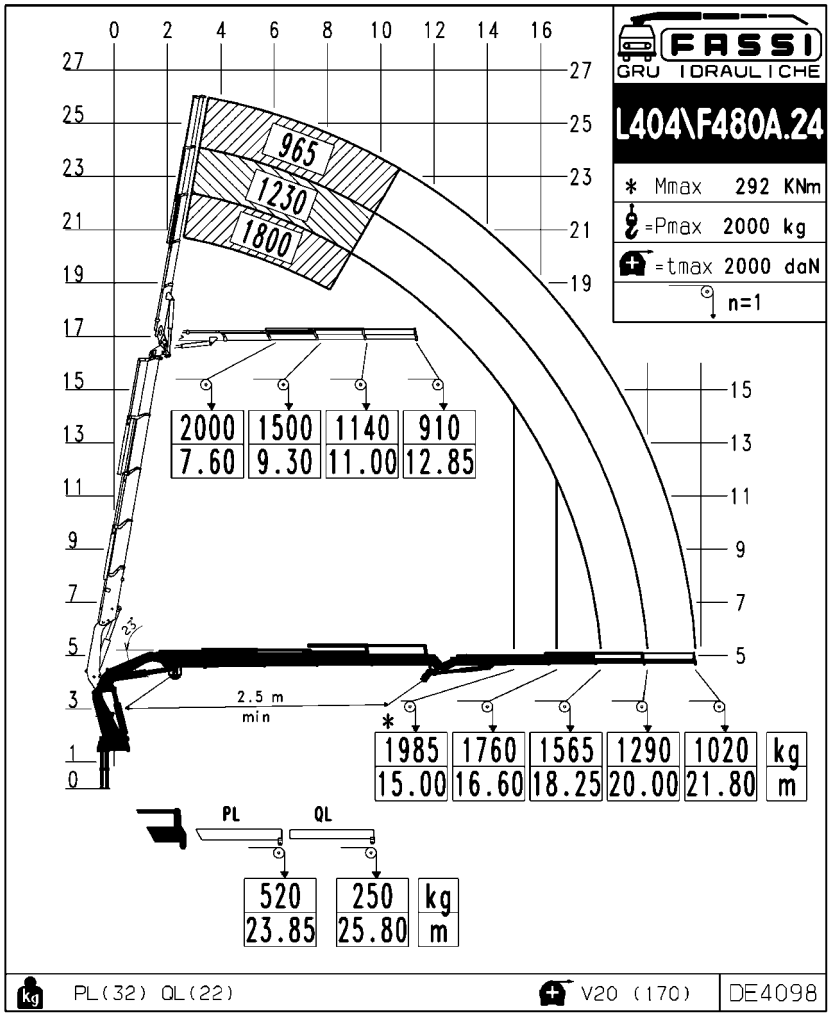

FASSI GRU IDRAULICHE
L404\F480A.24
* Mmax 284402 lbs.ft
=Pmax 9921 lbs
3748
4188
5070
6393
9921 | 6019 | 4078 | 3042 | 2414
19'4" | 24'5" | 30'0" | 35'9" | 41'8"
9921 | 6393 | 4630 | 4112 | 3616 | 3108 | 2469 | lbs
28'8" | 39'2" | 48'9" | 54'0" | 59'7" | 65'1" | 71'2" | ft
PL QL
1323 | 661 | lbs
77'9" | 84'4" | ft
PL(70) QL(48)
DE4089

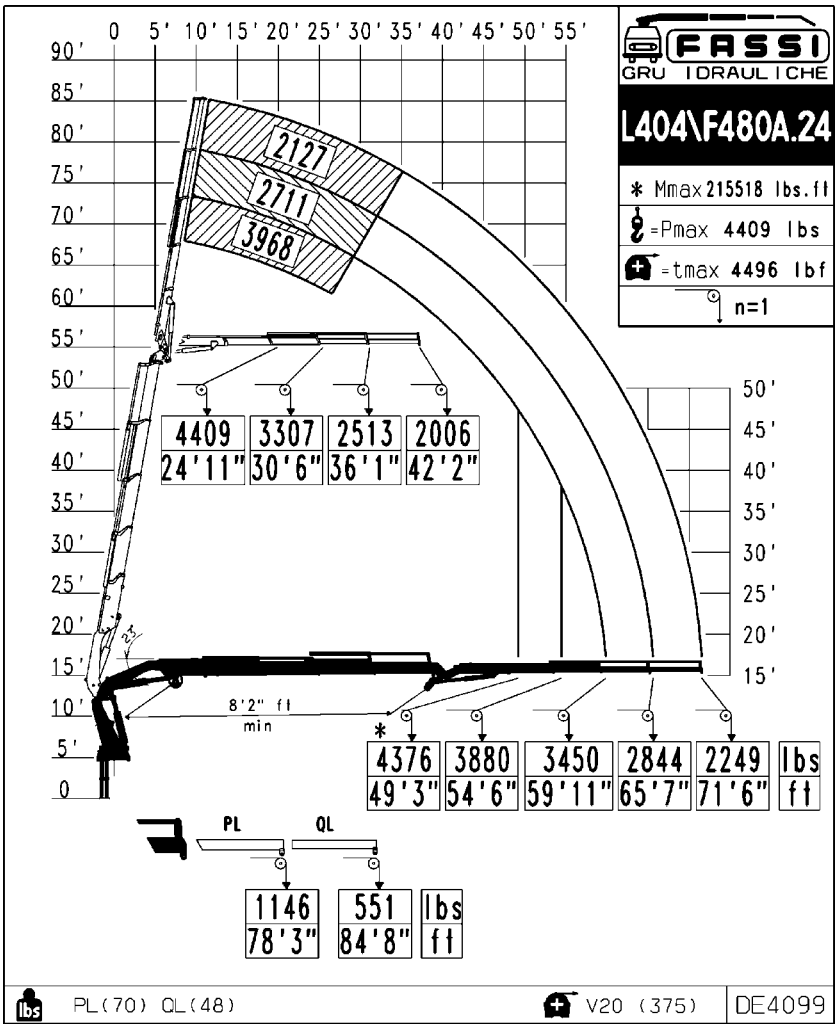
CAPACITY PLATES FOR CRANE WITH LIFTING MOMENT LIMITING DEVICE

F 480A.24






FASSI
GRU IDRAULICHE
L404\F480A.24
* Mmax 292 KNm
=Pmax 2000 kg
=tmax 2000 daN
n=1
965
1230
1800
2000 1500 1140 910
7.60 9.30 11.00 12.85
2.5 m
min
1985 1760 1565 1290 1020 kg
15.00 16.60 18.25 20.00 21.80 m
PL QL
520 250 kg
23.85 25.80 m
PL(32) QL(22)
V20 (170)
DE4098


FASSI
GRU IDRAULICHE
L404\F480A.24
* Mmax 215518 lbs.ft
=Pmax 4409 lbs
=tmax 4496 lbf
n=1
2127
2711
3968
4409 3307 2513 2006
24'11" 30'6" 36'1" 42'2"
8'2" ft
min
4376 3880 3450 2844 2249 lbs
49'3" 54'6" 59'11" 65'7" 71'6" ft
PL QL
1146 551 lbs
78'3" 84'8" ft
PL(70) QL(48)
V20 (375)
DE4099